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THE MINE

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By

Charles Howard Shinn



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The Miner. I.

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From an Original Painting by Frank T. Johnson

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The Miner. I.

EDITOR'S PREFACE.

IN accordance with the plan of the Story of the West Series for the presentation of the characteristic phases and types offered by the evolution of the real West—the great country lying for the most part beyond the Missouri—Mr. Shinn, out of a singularly complete personal knowledge, tells in this volume The Story of the Mine. Like Mr. Grinnell, in his Story of the Indian, Mr. Shinn does not aim at a comprehensive history, but he illuminates its salient points. There are allusions in his pages which afford glimpses into this romantic and varied history from the Toltec legends, the Aztec discoveries, the fierce treasure hunts of the Spaniards, the desultory quests of later Anglo-Saxons, the epoch-making event at Sutter's Mill, the development of the great Comstock lode, and the feverish searching from the Sierra Madre to Alaska, which at one time and another has brought before the world the gold fields of Idaho or the blanket deposits of Tombstone, the mineral riches of Leadville or the wealth of Butte and Helena, the placers of California, or the ores of Cripple Creek. These glimpses show us

the figures of the prospector and the miner, types different yet still closely related despite the vast modern changes in conditions and methods. By dwelling particularly upon the life history of one great lode, Mr. Shinn has succeeded in bringing these figures out in clear relief, and also in presenting some of the more significant aspects of the evolution of the mining industry. It is not easy for one who has camped with eager prospectors, who has followed the miner's candle through dark galleries and has seen the sharp contrasts of mining life, to introduce such a narrative as this without emphasizing, perhaps unduly, its romantic interest. That interest is constant, but there is also the interest belonging rightfully to a great industry which energy and science have developed to a high point of perfection. Nowhere else on this continent has this development been better illustrated than on the Comstock lode. Nowhere else could the author have found a happier means of exemplifying the entire range of mining life.

The picture of this life drawn by Mr. Shinn is of lasting as well as timely interest. He has not written to advocate any theory, nor to deal with any special issue. He has simply told the actual story, and it is such writing which is needed for a better understanding of the conditions met with, and the splendid energy and resourcefulness displayed in the building of our West. Within the last few years expansion westward has been checked and the reaction has brought prob-

lems which may seem serious, though no true American can be doubtful as to the ultimate destiny of our country. Many of the typical figures of Western development have passed, and their preservation as historical types is the object of this series. The miner, though transformed in many ways, is a figure of the present as well as the past, and in presenting him and his work in this volume, Mr. Shinn has not only contributed to American history something of lasting value, but he has also furnished for those who sometimes read between the lines another reason for pride in the qualities which have conquered this continent and an aid to the understanding and sympathy which make for a perfect national unity.

RIPLEY HITCHCOCK.

AUTHOR'S PREFACE.

IN times when a dedication to some individual was thought as necessary a part of a completed book as the title page, I should have had serious trouble in choosing among the many who have helped me in the writing of this book. There are some now with us no more—genial J. Ross Browne, honest Henry De Groot, thoughtful Dr. Gally, and others—more than I have space to name. There are some who still live in this busy world, and who once helped to chronicle from day to day the life of the mining camp—Dan De Quille, the only real historian of the Comstock; Judge C. C. Goodwin, of Salt Lake; Arthur McEwen; our own Mark Twain; and Sam Davis, of Carson. Many other builders of Nevada have helped in the preparation of this volume, from Mayor Sutro, of San Francisco, to scores of miners and prospectors. Prof. S. B. Christy, of the University of California, has kindly looked over the more technical chapters. Without venturing upon a formal inscription to any one, in these days when dedications appear a little out of place, I have, nevertheless, held in mind all the toil-

ing frontiersmen of the world of miners. This volume, therefore, is in essence, though not in name, dedicated to that vast body of men whose daily life it describes, and, not least among them, to that plain, lonely workman, the American Prospector.

CHARLES HOWARD SHINN.

NILES, CALIFORNIA, *September, 1896.*

THE STORY OF THE MINE.

CHAPTER I.

MINERS AND MINING CAMPS.

THIS book is not a technical treatise upon the mining industry. It is only an attempt to describe in a clear and simple way some of the every-day features, as well as some of the unusual things, that belong to mines, keeping constantly in view the purely human elements of the story.

Many writers go into the mining camps of the West and endeavour, after various fashions with varying degrees of success, to fix in words the changing life of those camps. More often than otherwise the resulting poem, story, or sketch rings false; it is overwrought and passionate; it lacks the simple emotions; pistols and bandits abound in a nickel-novel atmosphere. Things that are on the surface of mining-camp life are easy to see, but no one can give even this a reality unless he understands the people and the occupation by that which is more than study—the sympathy and affection born from years of close fellowship.

I remember an old Nevadan silver freighter who walked all day long for many successive weeks, months, and years beside his high ore wagon across the Nevada desert. He was one of brave old Dr. Gally's com-

panions; he had read those rough, breezy, genuinely frontier articles that "Single-line" used to publish in mountain newspapers; he knew the whole Iliad of the Nevada fighting editors by heart. I remember well how slow, simple, and methodical was this old American silver freighter, patiently plodding back and forth over a land of desolation, placidly sorting out his ideas until they were as sweet and real as winds from Sierra pine forests.

Said he, one night in camp, "I had an odd notion lately. I thought that perhaps one of these days, when all the frontiersmen have been dead a hundred thousand years, the stories that will be written and believed about them will be much like those of the demigods." My old freighter could have shown a college degree if he had cared to (which he never did), and he knew his mythology as well as Leland knows his gipsies.

"Some fellow, I don't know who," the silver freighter continued, "has got to stand right out from the ruck some of these days to represent all the pioneering that has been done by hundreds and thousands of us for generations on this continent. It might be a fellow with buckskins and Kentucky rifle, or another with slouch hat and mule whip, or Doc. Gally's 'Big Jack Small,' the bull-puncher.

"As I was saying, it might turn out to be a plain freighter. But the freighter is simply packing around some one else's ore. The miner is behind him, working even harder. Out yonder, fifty miles in the desert, there's a man and his wife hammering the drill, blasting rock, opening their mine. Been there all by themselves for five or six years. Maybe their mine will peter out; maybe they'll die there, and some ore freighter will put them under the sand.

"Yes, and behind the miner there's another fellow

of the same sort, only more primitive. Sometimes I think he stands up taller than all of us put together. He is looking for ore, and he keeps on looking till he dies. When every mine has been found, named, and worked, when the whole land is settled and has been fenced off into acre-lots and forties for ten thousand years, what kind of stories do you suppose men will be telling their children about the Nineteenth-Century Prospector?"

My old silver freighter leaned silent on his whipstock. Lonely, toiling men and women of countless mining camps, not only in America but all over the world and ever since the bronze age began, seemed to become but voices that mingled in one great chorus as the separate parts of the ship in Kipling's story found, by losing themselves, the Voice of the Whole. We stood side by side, and both of us were thinking of the myth spirit which works continually among men, but only at long intervals reaches full achievement. The goddess of myths has not chosen among the founders of the American colonies, splendid though their victories were; nor has she taken the buckskin-clad Boones and Crocketts, for even these, though unique, lack something of the universal. It will not be trapper, or hunter, or mountain guide, or Remington's virile horsemen, noble and eloquent types though all these certainly are.

But what is more likely, when one considers the settlement of the far West, than that a myth of the miner shall grow, unseen, and find ultimate expression in art, song, and literature? The hills will some day be empty of gold. The waters will reclaim the deserts. New and strange conditions of life will prevail over all the lands between Atlantic and Pacific. But the great myth story of the West will have to do with some Titan

of Sierras or Rockies, leaning upon his mighty pick, as Thor upon his Mjølner. Strong and lonely as a grizzly, the prospector will "stand right out," in the words of the silver freighter, "to represent all the pioneers."

Far enough are we from any immediate apotheosis of the much-enduring miner, who is the last of men to magnify his calling. If, now, we endeavour to select some group of mines, or some mining period of especial importance, which shall fitly illustrate the more brilliant achievements of miners, we shall have many claimants to consider. One might even find great and characteristic groups of classic mines in Mexico and South America, such as the Sierra Madre with its authenticated yield of more than \$800,000,000, or the still more famous Potosi, which in three and a half centuries poured forth about \$1,400,000,000 in gold and silver. The Spanish American is a little-understood fellow-creature, with an especially "good nose for silver," as the saying goes. Some one will come along, sooner or later, who has carried ore in rawhide bags up the slippery, notched posts that the Mexicans call ladders, who has summered and wintered with José and Juan, and who knows their pet superstitions, their hereditary and acquired mine lore. Then we shall have the quaint and pretty story of the Mexican mine, but the story herein told must keep to more familiar ground.

In the United States there has never been a more dramatic episode than the Californian gold rush of 1848-'50—an episode that is in its way unique, the very epitome of the whole history of placer mining. After California were the gold placers of Colorado, Idaho, and Montana—the days of Pike's Peak, Salmon River, and golden Helena. As trained prospectors continued to explore the Sierras, the Rockies, and other mountains of North America, these were followed in

swift succession by many equally important mineral discoveries. Then came the news of the famous fissure veins of "King Solomon Mountain," Ouray, and the whole wild San Juan region, first entered by that brave old prospector, John Baker, in 1860, but opened to the miners in 1873. Next, still-thriving Leadville won renown, with its "six log cabins" of August, 1877, and its "thirty-four huge smelters" of December, 1879. Work had hardly begun on the Leadville carbonates before Richard Gird and the Scheffelin Brothers were astonishing the mining world with the rich chlorides, carbonates, and horn-silver of Tombstone.

The glories of many of these earlier camps have somewhat paled in recent years before the sudden and splendid records of new groups of mines, such as Cripple Creek and other frontier camps. Within the past five years more than a hundred promising new camps, some of them extremely profitable from "grass roots down," have been established all the way from the Mexican borders to the Yukon and its tributaries.

Nor has it been in the United States alone that mining for the precious metals has greatly increased in importance. The world's average yearly yield of gold alone during the first half of the century was only about \$16,000,000, but the statisticians tell us that in 1895 about \$205,000,000 in gold was taken from the mines. The details of this extraordinary increase in the world's mine-yield belong to the history of colonies, states, and nations. A few of the more striking results can be given here. Russia, owing to Siberian discoveries, turned out \$34,000,000 in gold last year, the highest amount in her records. Australasia has increased its output from \$25,000,000 in 1887 to \$44,000,000 in 1895. The total yield of Africa was about the same last year as that of Australasia. New mines

are rapidly making records all the way from Patagonia to British Columbia. Even now syndicates are endeavouring to obtain entry into the mineral districts of China, hoping to find another California.

While this book was being written, mining interests the world over were each day more potent factors in the social, industrial, and political life of the nations. New captains of industry have come to the front in lands which five years ago were strange names in the ears of men. Frontier battles have been fought, the world's peace has been seriously threatened, the whole complex machinery of modern diplomacy has been set in motion to avert disaster, and through it all one hears the vibratory ring of the miner's drill, uncovering hidden ledges in Africa, Asia, South America, and rousing the fierce gold hunger of mankind. Plot and counterplot shake the secret places of the earth to-day, and, for a time at least, the central figure of it all is the prospector, going forth to strike again the keynote of Spain, of California, of Australia, of South Africa; to find and conquer a desert, waste and terrible; to build cities, and carry farmers to unpeopled valleys; to give to the new land railroads, fleets of ships, mounted police, armies, legislatures—and then to fling it down, one more colony or commonwealth, whose corner stone is based on quartz, and to go on into some untrodden wilderness.

What a strange and brilliant procession of bankers, lawyers, speculators, politicians, statesmen, cabinet ministers, lords and ladies of high degree, princes of blood royal, presidents and monarchs are, even now, pressing with reckless haste on the trail of the flannel-shirted prospector! No great artist has ever painted a picture of this wild procession, storming so fiercely into newly discovered groups of mining camps. Each

generation would have different figures made prominent, but there would always be the camp followers, the outriders, the dead and dying, the utmost follies, the darkest crimes, the noblest self-sacrifices. Limitless avarice, Timon-like hate, courage great as that of the gods themselves, are in the unending march. Some few loom up along its changing lines, the briefly worshipped, the swiftly forgotten, of each fierce gold rush. Once it was some nameless Phœnician speculator, some Roman who farmed out half the mines of Spain, some successful free-lance adventurer from India or Brazil. History has kept scant record of the thousands of Rhodeses and Barnatos, of I. D. B. robberies, of outlanders and of chartered companies, the men who rose and fell, singly or in groups, ceaseless and changing as the waves of ocean, age after age, while the miner moved on from camp to camp with this multitudinous army roaring sealike in his wake.

CHAPTER II.

A LAND OF PRECIOUS METALS.

As it happens, there is one place in America where mining for the precious metals has been carried on upon so grand a scale and under such stupendous difficulties that the results of the struggle with Nature's forces have greatly affected the mining interests of the world. Whether we consider the Comstock vein of Nevada from the standpoint of its mineral yield, or study the dramatic elements in its strange history, the group of mines along its course is typical, in the most complete sense, of the dangers and vicissitudes of mining life. The term "Comstocker" is known in every country and in every language; the Comstock miner is everywhere recognised as a post-graduate among miners of other camps. World-famous mining engineers have taxed their utmost skill in the service of the Comstock; the greatest geologists have given laborious days to the study of its marvels; travellers have gazed upon its mighty engines and threaded its vast underground cities; metropolises have been stirred to their profoundest depths by mining news from Comstock bonanzas. The reports of the United States Geological Survey sum up many laborious volumes about the Comstock by such statements as these: "Contributions of the first importance to mining science have been furnished." "Through contentions of its rival locators, our national mining legislation was mainly shaped."

“No subsequent discoveries can rival the influence of the lode.”

Nevada, the country of the Comstock, is a part of the wonderful plateau known as the “Great Basin,” lying between the Rockies and the Sierra Nevadas. I am indebted to Mr. S. T. Gage, of California, for knowledge of a remarkable prophecy made by Horace Greeley respecting this then-neglected region, in a speech delivered on the plaza of Placerville in the summer of 1859.

Toward the close of his address came these sentences: “Lastly, I have come across a desolate and terrible country, a land seemingly worthless forever—the Great American Desert. But I believe that the Almighty has created nothing in vain, and as I have passed over this awful region, the thought has fixed itself in my mind that, since it is certainly useless for every other purpose, it may be a land of vast mineral wealth. If that be so, it will take a hundred thousand Californian miners a hundred thousand years even to prospect it.”

The rugged plateau to which Greeley alluded is from two to five thousand feet above the sea, and is between five and six hundred miles wide, becoming more narrow and sinking toward the north and south. Nevada, a large part of Utah, and parts of Oregon and California are included within its limits. The Great Basin, whose rims are the Sierra Nevada, the Wahsatch, and the Blue Mountains of Oregon, is crossed by mountains that divide it into a group of lesser basins, such as the Humboldt, the Washoe, the Carson, and the Walker. Even the valleys of the higher portion of the plateau are five and six thousand feet above the sea, while the greater mountain peaks rise five thousand feet more.

There are extensive deserts in the Great Basin, examples of which are the famous Death Valley, the Black Rock Desert, the Sage Desert, the Desert of the Colorado sloping south and west, the Forty-Mile Desert of the Humboldt region, and the Bitter Water district of the Armagosa. Everywhere are alkali plains spotted with scanty bunch grass and miles of basaltic rock, where a few stunted junipers and thorny cacti grow. Horned toads, lizards, scorpions, tarantulas, brush rabbits, sage hens, and innumerable crickets were about all the living creatures that the pioneers found as they toiled painfully across the deserts on their way to Oregon and California.

During ancient geologic periods, when the Rockies and the Sierras were being slowly uplifted from the ocean, an immense area of deep seas holding minerals in solution were for a time inclosed in the Great Basin, and beds of salt, sulphur, mica, borax, soda, arsenic, manganese, and other minerals deposited in water, remain as relics of that inland ocean. If the basin thus formed had contained no other mountains, the great desert would have been nearly or quite impassable for many years, and the development and history of the United States would have been seriously modified by a Sahara between the Mississippi Valley and the Pacific coast.

The problem of the method of ore distribution has interested leading geologists. According to Baron Richtofen, immense floods of fluid matter from undercrushed and folded strata of rock were slowly forced out through fissures during the gigantic processes of mountain creation. What Prof. Joseph Le Conte calls the "submountain reservoir" of fused matter thus supplied the sheets of lava many feet thick that occur in the Great Basin. The contents of the metalliferous veins were deposited by hot alkaline waters that came

up through fissures with various minerals in solution. There are many different classes of mineral-bearing veins of rock, but the desire of the quartz miner is to find a "true fissure vein." By this he means one of the great breaks or fissures caused by a movement of the earth's crust and filled with ores—that is, with slowly deposited mineral substances. Such fissure veins are often very wide, of an immense depth, and occur in parallel groups.

The mountain system, more closely examined, grids the country with a hundred ranges from fifty to a hundred miles long. They rise three or four thousand feet above the plateau, the passes through them are often high and difficult, and many an isolated valley, remote from civilization, lies between their peaks. History is written in the strange names of these mountain chains. Some carry the trade-mark of the American trapper or prospector, as Carson, Buckskin, Muddy, and Pancake; others are Spanish, as Cortez, Pinon, and Vegas; but by far the greatest number are Indian, as Washoe, Toano, Shoshone, Toiyabe, Toquina, Wahsatch, and Pahrana-gat. Between the dark, treeless, and forbidding mountain ranges are narrow plains or valleys, some only a mile wide. The melting snows keep the grass green in the ravines and supply occasional springs and rivulets along the bases of the mountains, which unite in a few small rivers, every one of which, excepting the Rio Virgin and the Owyhee, soon disappears in the ground or in some lake or depression called a sink.

The earliest maps of the Great Basin and the traditions of Spanish explorers are only important as they serve to show the source of later misconceptions on the part of traders and colonists. The John Harris map of 1605 "seems to give," says Bancroft, "the name Qui-

vira to a vast region which embraces Nevada in common with other undefined countries." In this map California is the island of Nova Albion. On the mainland, larger than Lake Superior, was the Lake of Thongo, from which two great rivers flowed to the Pacific. Most of its errors were perpetuated in Finley's map of 1826. According to such maps, the journey from the western base of the Rockies was through a comparatively level and well-watered country. The wandering trappers knew better than this, and map-makers would have done well to consult rough old Jim Bridger, Captain Ashley, or such leaders of the Hudson Bay Company as Peter Ogden, who was trapping on the Owyhee and the Humboldt long before Finley published his famous map.

But the trappers left little or no record of their wanderings, although they crossed the Sierras to the Spanish settlements, and named many a mountain peak and alpine pass in the years between 1825 and 1840. Walker, the guide, heroic William Sublette, Kit Carson, Captain Wyatt, Jedediah S. Smith, and nameless free trappers were adventurers in the Great Basin, and some of them soon carried back stories of placer gold, or even showed flakes of the precious metal when they wintered at the noisy frontier posts of the Rockies. For the most part, however, their tales were of suffering and disaster, of thirst and hunger in the deserts, and of hair-breadth escapes from hostile beasts and men.

After Frémont's explorations in 1844 and 1845 the main lines of travel were fairly well mapped out, and immigration went on with hardly a pause. The nomads of the Great Basin saw their hunting grounds invaded by longer lines of wagons and larger camps of white men. By 1847 the trails of the trappers had become

such pathways that no guide was needed. Books, maps, and newspaper articles began to be published, giving directions to emigrants; signboards were put up at some of the points where roads divided. Rivers of changing life were flowing out of the Mississippi Valley toward the Columbia and the Golden Gate.

The fateful year 1848 brought the discovery of gold in Marshall's mill-sluice, and in an hour after the news went abroad the number of overland emigrants began to multiply. The beaten track became a broad highway, strewn with wrecks of wagons and bones of horses and cattle. Whole families took the long and toilsome journey through Salt Lake Valley, where the Mormon faith was established, and across deserts and mountains, day after day, week after week, until the crest of the Sierras was reached and every river flowed to the Pacific. One and all were gold seekers going to the California placers to make their fortunes. Their thoughts and talk were often of mining and miners. Yet these thousands of immigrants made camp after camp in what is now Nevada without dreaming that precious metals were hidden within easy reach!

CHAPTER III.

MORMON AND PIONEER GOLD.

WHILE eager miners were exploring the ridges and cañons of the western Sierras, the Latter-Day Saints, or Mormons, recognising the profound significance of the conquest of California and the discovery of placer gold, were making a gigantic effort to claim and conquer that great inland empire which they named the State of Deseret. The miner, whom they had learned to fear, had crossed this vast and undeveloped region, had pitched his tents where Mormon leaders were dreaming of a future seacoast possession. There was to be a struggle for that which remained. The famous State of Deseret, organized March 18, 1849, contained Utah, Nevada, Arizona, parts of Wyoming, Oregon, and Colorado, and nearly half of California, including San Diego Bay. Hundreds of the most prosperous mining camps of America lie within this huge circle.

The Mormon Church, after claiming this enormous domain, began to strengthen its outside colonies and established many others, to acquire political influence in new communities. It is easy to see that if the war with Mexico had been delayed a few years longer there might have been another independent State besides Texas, carved from Mexican territory, and treating with the United States of America as with a foreign power.

Immediately after organizing their new State the Mormons sent an expedition of eighty men into the western country, some of whom built a log cabin at "Mormon Station," in Carson Valley. After completing the "first American house in Nevada" they crossed over the Sierras and bought their supplies, also provisions to sell to the immigrants. Returning, they sold out the cargo and made a second trip to California before winter. None of these men were miners, but Beatie, the founder of this first trading station, says in his manuscript narrative, in the Bancroft Library, that in 1849, while he was in California buying supplies, one of the men left at the station washed out a little gold in the gulches near Carson Valley. On his second trip the news was told to some Mormon miners, and in the spring of 1850 men crossed the Sierras to prospect for placers.

But the real beginning of placer mining was early in 1850, when a Mormon emigrant train on the way to California camped in Carson Valley to recruit their animals, and several of the party made a prospecting tour along the river and its tributaries. Near the site of the present town of Dayton, at the mouth of Gold Cañon, they found gold, though not in large quantities. The details of this discovery are interesting. On May 15th William Prouse "took a tin milk pan, went down to the creek, and washed out a little of the surface dirt." If there had been any prospectors in the party the riches of Gold Cañon would have been discovered in a short time from this clew, but the Mormons only saw the ashen-hued, barren land which they were anxious to leave; they went on, but found the great Snowy Range, as they called the Sierras, still impassable, and so they turned back to their former camp. John Orr and Nicholas Kelly now named the ravine

Gold Cañon, and they spent three weeks looking for the precious metal. On June 1st, Orr "thrust a butcher knife into a crevice at the edge of a small cascade" and pried out a nugget worth perhaps ten dollars. A few days later the whole company packed up and crossed the Sierras.

Whether Prouse and Orr told others or not, the news of the discovery somehow crept abroad. In August some immigrants camping in the valley saw a train of Mexicans with mules and wooden bowls, provisions and miners' tools, crossing the hills to Gold Cañon. Two American boys among the immigrants followed the Mexicans and found that Don Ignacio Paredes was the chief, and that the party was originally from Sonora, Mexico, but had recently come from California. Provisions were so costly, however (flour being \$1.50 a pound), that several small groups of miners who tried to work the Gold Cañon placers abandoned the region in 1850. Nevertheless, this discovery led in time to the discovery of the Comstock lode, for Gold Cañon heads far up the side of Mount Davidson, and the metal it contained came from the wash and overflow of the great fissure vein.

Congress had meantime refused to accept the desired Deseret boundaries, but Utah Territory, as organized September 9, 1850, extended from the Rockies to California, including the whole of what is now Nevada. The latter region soon became known as Western Utah, and, separated as it was from the Salt Lake Valley by mountains and deserts, it presented serious problems to the Mormon leaders. Many of the settlers they sent out crossed into the California placers, or became slack in their allegiance to the Church. Every effort was made to establish permanent settlements and gather farmers about the rude trading posts, but the load-

stone of the mines was too strong, and by the autumn of 1850 all the Mormons who were not swinging rockers in Gold Cañon moved on to California, while Indians burned the deserted cabins.

Another attempt to hold the country was made in the spring of 1851. Colonel John Reese, leading a well-equipped party of colonists into the upper Carson Valley, re-established a trading post on the site of the first Mormon station. They bought a piece of land from Captain Jim, the Washoe chief, for two sacks of flour, and made a fifteen-foot stockade of cottonwood logs, inclosing an acre. Inside of this they constructed a log house as a fort, trading post, and dwelling, the only permanent dwelling in Western Utah. One would think that now, at last, the Mormons had a good foothold.

Nevertheless, the newcomers soon felt the spirit of speculation. First one, then another strayed up Gold Cañon, and in a few months most of them were in the camps. One of these was a feather-brained, bibulous teamster, whom Reese had picked up in Salt Lake—James Finney, or Fennimore, afterward widely known as “Old Virginia,” and one of the discoverers of the Comstock lode. Captain Reese’s expedition, from which so much had been expected by the Mormons, had done little except to bring still more miners into the country.

The scattered placer camps of Western Utah at this period were very simple in organization. None of the miners acknowledged any Mormon officers. Their rude and brief laws respecting claims were similar to those of the California placers. Rockers and long toms were used. In the autumn and spring there were sometimes two hundred men in Gold Cañon, but by June of each year water was scarce and the place was nearly deserted.

Then the miners went down to Mormon trading posts and spent their money.

We have from pioneer chronicles a picturesque glimpse of life near one of the camps of the period. It was on the last night of the year 1853. There was a dance "in the log house, over Spafford Hall's store," at the mouth of Gold Cañon. Nine women were there, including a girl of ten, and one of the nine was Princess Sarah Winnemucca, the only Indian woman who mingled socially with the whites. The men numbered over one hundred. Besides stock raisers, ranchers, and frontier storekeepers, there were miners from the gulches—Oregonians, Californians, apostate Mormons, and winter-bound immigrants—every stroke of whose picks brought the day nearer when mining men should rule Nevada. All night long the dance continued in Spafford Hall's log house, and while the festivities were at their height the Washoe Indians stole every horse in the settlement.

The Mormons in 1856 made their last efforts at aggressive colonization, sending sixty to seventy families to Carson Valley, and smaller parties to other portions of Nevada. Arriving before local elections, and being well organized, they placed Mormons in nearly every office. The miners held squatter meetings, and began to talk about secession from Utah. While things hung thus uncertain, Brigham Young, in 1857, suddenly abandoned the struggle, partly because Salt Lake had trouble of its own, partly because the astonishing growth of California seemed to nullify all his efforts along the eastern base of the Sierras. He sent out messengers, and peremptorily recalled every Mormon in Western Utah. Some fifty-four families in Carson Valley left their cabins, sawmills, claims, water ditches, and property of every sort, giving it away or selling at a ruinous sacrifice, and returned to Salt

Lake. The entire number of Mormons who left Western Utah was four hundred and fifty, in one hundred and twenty-three wagons, and they were on their way to Salt Lake within three weeks after the mounted messengers arrived with the commands of the Prophet. Some of the little settlements were nearly depopulated for a time, until "gentiles and apostates" had filled the vacant places.

Orson Hyde, the apostle, years later, when the Comstock miners had made all Nevada property extremely valuable, wrote to the then owners of a sawmill he had built in "Wassau," now Washoe Valley, saying that unless they restored it at once (which they never did) the curse of the Almighty would utterly destroy them. "This demand of ours remaining uncanceled shall be to the people of Carson and Wassau Valleys as was the Ark of God among the Philistines. You shall be visited of the Lord of Hosts with thunder and with earthquakes, with floods, with pestilence, and with famine, until your names are not known among men."

Carson County, thus abandoned by the Mormons, was for a time left without a government. Great Salt Lake County, eight hundred miles distant, claimed jurisdiction for "election, revenue, and judicial purposes," and was ordered by the Utah Legislature to take possession of all the records and documents. The people then drew up an earnest memorial to Congress. Even in the summer time, they said, they were destitute of all power of enjoying the benefits of the governments of Utah or California, while in the winter communication was frequently cut off for several months. "Outlaws, criminals, and convicts abound, and the region is only saved from anarchy by an occasional session of Judge Lynch's Court."

The placer miners in Gold Cañon were entirely in-

different to the departure of the Mormons. They worked on, washing auriferous gravel from the bars, or carrying rich earth from dry ravines to the nearest stream. They lived in little brush huts, or tents, in summer, and in cabins of rough stone in winter. Gambling and drinking were the only amusements. The work was very hard and monotonous. Often men hardly made a living. Until a mill was built in Carson Valley, the price of flour was apt to go very high in the winter—as high as two and a half dollars a pound. By 1855 this price had fallen to fifteen cents, and potatoes, which once sold for a dollar a pound, could be had for five cents.

At times the miners suffered greatly from lack of the necessities of life. One winter many Gold Cañon miners were without boots. All that were obtained had been carried across the Sierras by the famous "snow-shoe Thompson" on his Norwegian snow-skates. He often took one hundred pounds upon each of his journeys between Placerville and Carson, which he made in three days one way and in two days the other. To add to the miners' discouragements, the placers were nearly worked out by 1857. In the years between 1850 and 1857, inclusive, the total number of miners at work in Gold Cañon had varied from twenty to two hundred. During this time the average of the daily earnings of each miner had diminished from more than five dollars to about two dollars. The annual yield of the placers, which was only \$6,000 in 1850, rose to \$118,400 in 1855, and then sank in two years more to but \$18,000.

When the last year of the '50's began, Western Utah still remained a comparatively unknown region, and its pioneers were losing hope. Trade had departed with the close of the placer-gold period of California.

In 1854, three hundred wagons had passed Mormon Station in six months; by 1858 hardly one tenth of that number went by this route. Most of the scattered trading posts—mere tents pitched in the desert to meet the pilgrims—disappeared, and their owners were on cattle ranches or running saloons in gulches whose placer gold was fast becoming exhausted. Nevada seemed to be a “played-out country.”

CHAPTER IV.

THE PLACER-MINING PERIOD.

IN the midst of the Carson and Washoe country are the Washoe Mountains, lying east of the Sierra Nevada and nearly parallel to that great mountain chain. A series of small alpine valleys separate them from the Sierras. The highest peak of this world-famous metalliferous mountain range is 7,827 feet above the sea and lies in the midst of a cluster of mountains of especial interest to the geologist and the miner. Gold Cañon, with its little stream, heads far up on the south side of the peak and extends to the Carson River. Other small streams head upon the north side of the peak and flow east through Six-Mile and Seven-Mile Cañons, reaching the Carson after many devious turns. The early miners, hidden deep in narrow cañons, knew it as Sun Peak, but after the Comstock discovery it was named Mount Davidson.

Here, in these barren mountains, within a semi-circle of less than ten miles radius from the top of Mount Davidson, was the scene of some of the most typical and stupendous mining developments of which the world has any record. But the tale, of which this is but the foreshadowing, still belongs for a little time to the placer miners of the early '50's, not to the Nevada heroes of '59.

Pushing up the gulch, the miners founded the little village of Johntown, which was situated in the ravine

four miles above the first trading station at its mouth. Between 1851 and 1858 Johntown was considered the centre of the mining activities of Western Utah, although it never contained more than a dozen shanties, as most of the miners lived on their claims, in tents, or "dug-outs." The old camp at the mouth of the cañon became known as Chinatown, because by 1856 the claims in its vicinity were occupied by Chinese, and sometimes nearly a hundred of them were at work there. The Americans left in the camp made violent objections to having their settlement known as Chinatown, and so they called it Mineral Rapids, afterward Nevada City; finally it became Dayton, and so remains.

The mining region had two rather curious newspapers soon after 1854. One, the *Scorpion*, was published at Mormon Station; the other was the *Gold Cañon Switch*, published at Johntown. Both were written on sheets of foolscap, and were passed from hand to hand up the gulch until they reached the most distant prospector in the range.

Johntown, in the days of its glory, was a great place for the game known among pioneers as "bucking the tiger," or "wrestling with the beast of the jungle." "Jacob Job, the leading merchant," says Dan De Quille, "used to give the boys all the faro they could take care of, and often a good deal more." He dealt "out of hand," never using a faro box. Old Billy Williams, of Carson Valley, another enterprising gambler, came into Johntown with the card game of "Twenty-one." A few days of free-hand faro and Twenty-one during the Christmas holidays generally sent all the luckless and reckless Johntowners back to toms and rockers, each man "a total financial wreck." Johntown in those days had also a Saturday-night ball every week at "Dutch Nick's saloon," and the three

white women in town, together with Sarah Winnemucca, the Piute princess, made up the set.

In 1857 some prospectors found gold in the clay of Six-Mile Cañon, a deep ravine that heads on the north side of Mount Davidson, while Gold Cañon is on the south side of the same mountain. All the gold in both cañons had been washed down from the decomposed outcroppings of the great mines, as yet undiscovered. From two opposite directions the placer miners were now unconsciously approaching the source of their gold. Tradition states that a wandering Mexican who worked a few days in Gold Cañon tried to tell the miners that among the mountains high above their heads was "mucho plata," "mucho bueno plata," but his anxiety to have them prospect there for silver mines was not understood till several years afterward.

Looking back on the situation, it certainly seems strange that so much ignorance prevailed. In modern times every miner who finds placer gold or loose mineral of any sort, known technically as "float," looks at once for its sources. But the early prospectors in the Mount Davidson cañons were typical miners of their period; nearly every one in the Western country was then equally ignorant. They were so entirely unsuspicious of the existence of the great Comstock lode, or of any silver-bearing rock, that when the quality of the placer gold they obtained deteriorated as they ascended the cañons toward Mount Davidson, they could not understand the reason. It became lighter in colour and less in value, because it was mixed with a percentage of silver, and this percentage increased until the bankers in Placerville, California, who bought their gold dust, would only pay thirteen dollars an ounce where they had formerly paid eighteen dollars.

Among the men who were mining in the ravine

when Johntown was in its glory were several who especially belong to the narrative. James Fennimore, or "Old Virginia," the bibulous, disreputable, and amusing teamster of Reese's expedition of 1851, represented about the average of the class to which half a dozen familiar Comstock names belong—Peter O'Riley, Patrick McLaughlin, Emanuel Penrod (known as "Manny"), Jack Bishop, Joe Winters and loud-spoken Henry Thomas Paige Comstock, known as "Old Pancake," because he always thought himself too busy to make bread. "And even as, with spoon in hand, he stirred up his pancake batter," says Dan De Quille, "he kept an eye on the top of some distant peak, and was lost in speculations." Comstock seems to have been a curious combination of shrewdness, vanity, ignorance, and spasmodic energy. Born in Canada early in the century, he had trapped and traded for many years, beginning in Michigan and ending in New Mexico, from which region he went to Salt Lake and drove a flock of sheep to "Western Utah" in 1856, sold them, and began mining in Gold Cañon.

CHAPTER V.

THE FIRST QUARTZ PROSPECTORS.

MEANWHILE, in the closing years of the decade, the most thoughtful and intelligent prospectors who lived in Washoe, two brothers, named Ethan Allen and Hosea Ballou Grosh, the sons of a prominent Universalist minister of Pennsylvania, were steadily at work searching from cañon to cañon for silver, gold, and other minerals. No one else in all that region was so well equipped for the prospector's work, none better deserved success, and none were so unfortunate. Among the many dramatic chapters of the story of the Comstock, nothing surpasses in human interest the simple story of these two miners.

Much that has been written about the Grosh brothers and the "first discovery of silver" is mere tradition and hearsay; in fact, their story has never been given its rightful place in the history of Nevada. I have been fortunate in securing from Dr. Richard Maurice Bucke, of London, Ontario, the loan of a manuscript account of the Grosh brothers, which for the first time makes a connected narrative possible. Dr. Bucke—their faithful friend and chronicler, who begins his narrative with: "In the summer of 1857 Allen and Hosea Grosh, George Brown, and the writer were mining in Gold Cañon"—appears in other records of the time as "the young Canadian prospector."

Leaving the mines after the experiences to be told in this chapter, he studied medicine, has been for years at the head of an insane asylum in Canada, and is known in literature by various essays and by his life of Walt Whitman.

Dr. Bucke describes the Grosh brothers as of medium height, slight in figure, good-looking, fairly well educated, very quick of observation, ready with expedients, gifted (especially Allen) with exceptional powers of original thought, thoroughly honest and honourable, absolutely devoted to each other, industrious, persevering, chaste, sober, and, above all, "filled with that genuine religion of the heart which is the salt of the earth." They went to California in the "schooner Newton expedition," leaving Philadelphia in February, 1849, endured more than ordinary hardships, reached the placer mines of El Dorado County, found little gold, and in the summer of 1853 reached the Western Utah camps.

They worked in Gold Cañon until the autumn of 1854, making only a bare living, then returned to California to prospect for quartz, but still without success. They were always working hard, but they never seem to have known anything except hard times. They just made enough to keep themselves going. Nevertheless, they never lost courage, and they hoped for better days. Writing home from California to their father (March, 1856), they give the first hint of Nevada silver:

"Ever since our return from Utah we have been trying to get a couple of hundred dollars together for the purpose of making a careful examination of a silver lead in Gold Cañon. . . . Native silver is found in Gold Cañon; it resembles thin sheet-lead broken very fine, and lead the miners suppose it to be. . . . We

found silver ore at the forks of the Cañon. A large quartz vein shows itself in this situation."

They did not obtain the two hundred dollars, but managed to reach Gold Cañon with great difficulty in September, and, as they soon wrote, "found two veins of silver at the forks of Gold Cañon. . . . One of these veins is a perfect monster. . . . We have hopes, almost amounting to certainty, of veins crossing the Cañon at two other points." Then they went back to California to try to earn a little more money, but failed completely. "We have had very bad luck," writes Allen.

In June, 1857, writing from Gold Cañon, Allen Grosh gives more particulars of their discoveries: "We struck the vein without difficulty. . . . We have followed two shoots down the hill, have a third traced positively, and feel pretty sure that there is a fourth." Their letter contained a diagram which certainly resembles the south-end Comstock ledges. They continue: "We have pounded up some of each variety of rock and set it to work by the Mexican process The rock of the vein looks beautiful, is very soft, and will work remarkably easy. . . . Its colours are violet-blue, indigo-blue, blue-black, and greenish-black. It differs very much from that in the Frank vein—the vein we discovered last fall." A few weeks later they write that the first assay gave results of \$3,500 per ton. This amount seemed to them impossible; but everything in the above memoranda confirms the idea that they had really struck the Comstock lode. Additional evidence is afforded by the story that one of their friends, Mrs. Ellis, who was to furnish some capital with which to open a mine, was told by them that their largest ledge was on what is now Mount Davidson, and she had a piece of ore containing "gold, silver, lead, and antimony," which description would very

well apply to Comstock outcroppings. A button of silver extracted from ore of one of their claims was shown to Dr. Bucke by Allen Grosh in 1857. One claim was the "Pioneer," another the "Old Frank," and a third the "Utah Enterprise."

Some remarkable references to the discoveries made by the Grosh brothers are given by a recently found manuscript written by Francis J. Hoover, a pioneer of '49, who died in San Francisco some thirty years ago. It is called *A True History of the Discovery of Silver in Washoe, then Utah, now the State of Nevada*, and is dated September 9, 1863. The story it tells is that in July, 1853, Frank Antonio, the "Old Frank" after whom the Grosh brothers named one of their mines, went from El Dorado County, California, with five others, to prospect in Western Utah. He had a horse stolen, and while searching for him "on a table-land running north and south and broadside to the sunrise" he found rich silver ore, which he knew, having worked in the silver mines of Brazil. He kept the specimen after he returned to California, and tried to interest men in the subject, but long without success.

Frank Antonio, the Hoover manuscript proceeds to say, then told the Grosh brothers, who had been mining in Gold Cañon, about his discovery of silver ore in that region, and finally helped them to organize the "Frank Silver Mining Company," composed of nine members, mostly Californians. In 1856 the Grosh brothers found what they supposed to be the main ledge, and located four hundred feet for each member of the company. This, Mr. Hoover believes, was along the axis of the Comstock lode. The first claim notice, he says, was posted on what is now the Ophir, and another was on Gould and Curry ground.

But the Grosh brothers had no capital and few

friends. They were compelled to work on the nearly exhausted placers of Gold Cañon in order to live from day to day. There is a story to the effect that a stockman and trader named Brown, at Gravelly Ford, on the Carson, had agreed to supply funds, and that they wrote him about their "monster vein." Selling out, he was about to join them, when some desperadoes murdered him. Meanwhile Hosea crushed his foot by a glancing blow of a heavy pick some time in August. He had poor food and was worn out with overwork. Blood poisoning set in, and on September 2d he died in their rude cabin of unhewn stones at the mouth of American Flat Ravine.

Dr. Bucke's manuscript says: "At the time of Hosea's accident they were about even with the world, were not in debt, and had nothing in hand. When Hosea was buried, Allen found himself some sixty dollars in debt." Allen had determined to cross the Sierras to California and interest persons of means in the silver claims. Although every day was now precious, as it was often dangerous to cross the mountains after October, he worked in the placers until he paid his debt, which took until the middle of November. Dr. Bucke also desired to go to California, and the two, loading a donkey with books, papers, clothes, blankets, and some provisions, started together upon one of the saddest of journeys.

Already it was snowing in the Sierras, and their donkey straying back at night, lost them four days more. It was November 20th before they left Washoe Valley to take an Indian trail which crossed the eastern ridge of the Sierras some nine thousand feet high, thence descended three thousand feet to Lake Tahoe, went up the main ridge of the Sierras some eleven thousand feet high, and followed the long western slope into

the California mining camps. The total distance from the last pioneer cabin of Western Utah to the first cabin occupied in winter in California was about a hundred miles.

Snowstorm after snowstorm overwhelmed them, preventing return, and finally, in Squaw Valley, near the top of the western ridge, a white, relentless wall surrounded them on every side. It rained, and grew colder, then snowed heavily. They made several futile attempts to cross the ridge with the donkey, exhausted their provisions, killed the donkey for food, whittled out some rude snowshoes, and on November 28th started over the soft snow. They climbed for hours, but took the wrong trail, and were compelled to return to Squaw Valley. The next day they managed to cross the summit, and reached a small summer cabin used by cattle men known to Dr. Bucke. Here they expected to find some flour and bacon, *cached* several months before, but Indians had taken everything. It snowed heavily, and they staid in the cabin until their donkey meat was nearly gone; then they started down the mountain sides. The snowshoes were useless; they kept finding and losing the trail, and circled on their own tracks. The damp had spoiled their matches and gun. They threw away everything they could—even Allen's papers—and ran for their lives. At night they burrowed in the snow for warmth; their clothes were constantly wet. It still snowed, and their strength began to fail. On December 3d they made only ten miles. That day and the next they wandered about the rugged cañons along the Middle Fork of the American. On December 5th they were still weaker. Dr. Bucke writes: "This afternoon, when exhausted and despairing, I sat down and, weeping, proposed to give up and lie down and die where we were. Allen said, 'No, we will keep

going as long as we can walk,' . . . and so after a little he persuaded me to make another effort."

On December 6th they were barely able to crawl along, often on hands and knees. They made about three quarters of a mile by noon, when they came upon the ditch and log cabins of Last Chance Mining Camp. "We were no longer hungry," writes Dr. Bucke, "and when food was offered us we found we could not eat. Our feet were badly frozen. We could not sleep. We got worse and worse. After a few days we became delirious. On the twelfth day after we reached the camp Allen died."

Thus three young men, friends and fellow-workers, who were interested in the development of Nevada ledges, had all perished—Brown by violence, Hosea Grosh by accident, Allen Grosh from exposure to the Sierra winter. Dr. Bucke, crippled and for a time broken in health, abandoned the life of a miner and returned to Canada. If Allen Grosh had lived a few months longer the whole story of the Comstock would probably have been different, and its earlier fortunes less chaotic. By his death the possession of the great Comstock lode was left to others, ignorant and undeserving—the heedless rabble, even then swearing loud oaths at the unknown metal that clogged their sluice boxes. None of the Californians whom the Grosh brothers had interested in their quartz ledges made any immediate effort to take possession. In fact, the clew was lost.

The Comstockers themselves have always credited the Grosh brothers with having taken at least the first steps toward the great discovery, and there is a growing belief among those who have studied the subject that these two men deserve to be remembered as the true pioneers of the district. In 1865, when Schuyler Col-

fax visited Virginia City, he presided at the ceremony of erecting a commemoration tablet over the grave of Hosea Grosh in the little Silver City cemetery. It still remains for the commonwealth of Nevada to search for the lonely grave of Allen Grosh in the Sierras, and then to bring the remains of the brothers together at the foot of Mount Davidson, under a shaft of Comstock porphyry on which should be written, "They were the First Quartz Prospectors on the Comstock."

Returning to the Grosh cabin of 1857, we find another thread of the main story. When the surviving brother, Allen, went on that fatal journey to California, he cast about for some one to leave in charge of his effects. Comstock seemed the most available. It is said that a written contract was drawn up; Comstock was to have a one-fourth interest in one claim for keeping it from being jumped in the absence of Grosh, and was to live in the little stone cabin. He does not seem to have been taken any further into Allen's confidence. Both the brothers were very cautious and secretive; but this claim, which was somewhere around the head of Gold Cañon, was now staked out, and known to many, so Allen probably thought it better to give Comstock a share than to have him persuade his associates to take possession. It is in perfect accord with what we know of these admirably equipped young prospectors to suppose that both the brothers understood Comstock thoroughly, and that they told him nothing of their "monster vein," the Comstock. The usual story is that Allen secretly *cached* his assaying tools and memoranda of their discoveries before Comstock was brought to the cabin, but Dr. Bucke's narrative shows that he threw all his papers away in the Sierras. Long after Allen's death, when his heirs and his former associates in California searched for evidence to bear out

their claims in court, little could be found. Did Comstock obtain the clew in some neglected paper in the Grosh cabin? Or did he live all winter in the rude stone hut where two brave, silent prospectors had lived in poverty, fighting slowly and intelligently toward one of the greatest fortunes ever lying before treasure-seekers—and did he only dream wild dreams and go back to his placers the same haphazard “Old Pancake”? Was the rediscovery of the Comstock wholly an accident? The reader must judge for himself in the light of Comstock’s behaviour during the early months of 1859—the days of Gold Hill and Ophir.

CHAPTER VI.

DISCOVERY OF THE COMSTOCK.

THE last year of real placer mining in Nevada was 1858, and long before its close the very air grew full of hints of change and growth. Dull of comprehension, ignorant of their position upon the verge of an unsurpassed mining excitement, the seventy-five or eighty men now working in the very tops of the ravines east and south of Mount Davidson were nevertheless beginning to feel the thrill and presence of the spirit of discovery. For the first time in years there was talk of prospecting parties throughout the district to look up better claims.

Johntown was again the centre of activities in the winter of 1858-'59, for the weather was unusually cold, freezing the water in the gulches, so that the miners had a season of enforced idleness. They spent it in discussing the situation, which certainly contained elements of pathos and sarcasm. Nearly all the Johnstown miners of 1858 were men who had been in the region for six or seven years. The only change in their occupations had come about as the character of the "diggings" changed. At first they had mined on the "bars," then on the "flats," then on the sides of ravines, ascending toward higher ridges. The ordinary auriferous gravel became of darker colour; the soil of the hills was heavier and heavier clay, though still containing gold. The ground was difficult to handle—

full of what they called "sand of iron" and a substance they called lead, and a "heavy blue stuff" that carried off the quicksilver. Sometimes a miner, after working all day long, from sunrise to dark, would go home with his back aching from the labour of cleaning his sluice box every few minutes from the "accursed base metal" that clogged every riffle. Down it was thrown, with fierce maledictions, to the bottom of the ravine.

Our story follows the fortunes of a little group of Gold Cañon miners—John Bishop, known as "Big French John," Aleck Henderson, Jack Yount, and "Old Virginia." One day, about the 20th of January, while they were on the ridge immediately east of the cañon in which the town of Gold Hill was afterward situated, "Old Virginia" pointed across to a small, low mound, and said, "Boys, I believe that some good diggings are waiting for us there."

"Let us go and try it," one of them answered.

"Some other time, boys; it's a deep gulch, and late in the day."

The "other time" came on a Saturday, January 28th, when the four men went to the mound as agreed upon. Bishop, who had a shovel, pushed it full of earth with his foot. "Old Virginia" found a gopher hole, and took a panful from the loose earth brought up from a foot or two underneath. They went down to a spring, and, washing it out, found gold. They immediately staked out four placer claims of fifty feet each, the limit allowed by the mining law in that district. "Old Virginia," who was held to be the discoverer, took the first choice.

According to nearly every account of the real discoverers, Comstock only "came in afterward"; but his own narrative claims entire priority and pre-eminence. "About the middle of January," he says, "I saw some

queer-looking stuff in a gopher hole. I ran my hand in and took out a handful of dirt, and saw silver and gold in it. Big John Bishop and Old Virginia were with me. When I found it they were sitting on the side of the hill a couple of hundred yards from me. I took up five claims."

The day after the discovery all the Johntowners came over to the little mound and passed their opinions upon the new diggings. The place was so small that most of them thought but little of the camp. However, it had to be named, of course, and that was always a difficult task. The fortunate or grotesque names of camps have come by accident; when the miner attempts deliberately to give a title to the place, his imagination generally fails him. It was so in this case. Cañon-town, Gold-town, and finally Gold Hill were the principal suggestions, and the latter was adopted, because, according to the naïve explanation of Big French John, "it was decidedly not Gold Cañon."

In a few weeks the miners on Gold Hill ran into "pay dirt" that was surprisingly rich for the district. They actually took out from fifteen to twenty-five dollars a day to the man. They were working in the detritus of the south end of the Comstock, Nature's own concentration of many feet of outcroppings, worn down and mixed with wash from the peaks of the Washoe Range. Great mines of the future—Belcher, Crown Point, Yellow Jacket, Imperial, Kentuck, Empire, and others that yielded immense sums a few years later—lay hidden in the solid quartz and vein matter that began hardly ten feet beneath the surface.

Old Virginia had taken up a spring in the ravine, but all the miners used it without rental. The dirt picked out from their respective claims was carried down to the water's edge and washed there, old-style

rockers being used. Pretty soon they had to pound the earth up with a pick handle, it grew so hard as they dug deeper into the hill. It contained plenty of the same "blue stuff" that had worried the miners in Gold Cañon, but they were becoming used to it by this time, and, besides, the claims were paying better than anything else in the mountains.

The most of Johntown moved there, abandoning the shanties in Gold Cañon, and Gold Hill soon had a store, a saloon, and a cheap restaurant. "Brush huts and a tent lodging-house among the sage brush" was a writer's description. Every one was pleased with the change except the Carson Valley ranchers, whose pack mules, loaded with eatables to be sold to the miners, had to travel farther and climb much higher.

Prospecting continued throughout the early months of 1859. Those who were not mining upon Gold Hill took pick and pan whenever they had a day to spare, and tried in vain to make wages in the gulches. Sometimes they found strange "stuff" that was not gold, and very small deposits of the precious metal—"pockets" in the hillside that yielded twenty or thirty dollars before they were exhausted. This aimless prospecting went on for several months, every one looking for another Gold Hill.

The real point of interest had shifted to the head of Six-Mile Cañon. Two Irish miners—Peter O'Riley and Patrick McLaughlin, long among the best known of the Johntowners, and old-time comrades—had been unfortunate in their recent ventures. Comstock said afterward that he was paying them wages at this time, and that they were working on his claims, but in fact they had determined to go to the Walker River Mountains to some new placers of whose richness many stories were told, and would have started at once, but



Hydraulic Mining.

had no money. It was necessary to dig it out of the ground, so they agreed to try one more claim in Six-Mile Cañon, and then leave for Walker River as soon as they had a hundred dollars "for a grub stake."

The only piece of unoccupied ground that seemed at all promising was on the hillside above all the other claims in the cañon, near a spring known as "Old Man Caldwell's," where some one had made a short sluice box for mining, but had evidently thought the spot unprofitable. They used rockers for a fortnight upon their claim, carrying the dirt to the spring, but the ground was hard, and paid them less than two dollars apiece for a long day's work. Remembering the inexplicable location of the Gold Hill diggings on the top of a mound, and guided in some degree by the colour of the soil, they now started a trench straight up the hill, in hard blue clay and yellowish gravel.

The little spring wasted down the slope, and they thought it would be a good plan to dig a pit in the clay so as to reservoir a few barrels of water. They began this early in June, and here, at a depth of four feet, they came upon a deposit of the same sort of dark heavy soil that had been found at Gold Hill. It was even darker, and sparkled with minute flakes of gold. Running swiftly to the mining trench fifty feet distant, one of them brought a pan and tested the new find. The bottom of the vessel seemed fairly covered with precious metal as soon as the gravel, clay, and "black stuff" were stirred up and allowed to slide over the edge.

This was the top of the world-famous Ophir, the north end of the Comstock. The main masses of the mighty fissure vein extended in parallel lines of fragmentary projections from the black mound of the Ophir south to the black mound of Gold Hill. At some

remote period, ages before, the great lode had risen hundreds of feet higher; uncounted centuries of chemical and physical action had worn and broken it until thousands of tons of the hardest of quartz was as soft as clay and as fine as sand. This is what miners mean by "decomposed quartz"; it can be panned out or washed in a rocker, long tom, or sluice box.

O'Riley and McLaughlin shouted with delight; they had found another group of rich placers, alloyed, to be sure, with the same base metal that made their gold so hard to sell to the bankers, but still as good as the best in that district. No more notions of Walker River; they began mining in desperate haste, first sticking up a claim notice of fifty feet apiece. By sunset they had two or three hundred dollars in hand, and a black streak of what all the miners considered "bogus stuff" began to extend down the slope.

Comstock made his appearance just as they were finishing the last clean-up for the day. He had been looking for his lost mustang, and now came galloping down the ridge, with his long legs dangling in the sage tops. He came up in a state of great excitement and shouted: "You have struck it, boys!"

Jumping from his horse and leaping into the excavation, he made a rapid examination of the prospects. Then turning to the two warm-hearted and good-natured miners, he told them in a voice of genial and confidential friendship that unless they managed the matter carefully they could never hold the claim. The three men sat down on the bank to talk it over.

"Look here," said Comstock, "this spring was Old Man Caldwell's. You know that; there's his sluice box. Well, Manny Penrod and I bought his claim last winter, and we sold a tenth interest to Old Virginia

the other day. You two fellows must let Manny and I in on equal shares."

O'Riley and McLaughlin objected strenuously at first, but they were a little afraid of Comstock, and, besides, fifty feet of a placer claim was more than they could work in a season; it did not amount to much, after all. So when Comstock added, by way of a clincher to the argument, that five persons, of whom he was one, had once located one hundred and sixty acres upon the bench as a stock range, and he thought they were within its boundaries, they gave up like lambs and agreed to everything that Comstock proposed.

It is a curious illustration of the free and easy life of the time that O'Riley and McLaughlin did not demand any proof of Comstock's statement. In reality, his claims to the spring had some colour, as he and his friends had used it, though no water-right was ever recorded. He might possibly have posted a mere notice on the "stock range," but it could only hold for ten days, as he never paid any fees nor occupied the tract. Every miner who owned a horse turned him out on the unfenced hills.

Now, and most unexpectedly, occurred the first "freeze-out" on the Comstock. Hitherto the miners had dwelt together in a sort of Arcadia, under their own laws, and were fairly just to each other. Comstock introduced a new deal. Having provided for himself and Manny Penrod, he went on to Gold Hill before the news of the strike reached that place and bought out Old Virginia's tenth interest in Caldwell's spring for the mustang he rode. Subsequent tradition adds the picturesque and very probable item of "a bottle of whisky."

Penrod's testimony is: "We thought it was a con-

tinuation of the placers that had been worked lower down" (at Gold Hill). "There was about six inches of pay dirt; it increased as we went up the hill. On June 12th the pay streak turned and went down into a ledge." This fixes June 12th as the date of the actual discovery of the Comstock. It caused no excitement, however, but was a source of regret, as it seemed to show that the diggings would soon be exhausted.

Comstock's own account of the whole matter is so artistic a piece of braggadocio that it must be quoted in order to round the narrative: "I had owned the greater part of Gold Hill; had given Sandy Bowers, Joe Plato, William Knight, and others their claims there. At Ophir, O'Riley and McLaughlin were working for me. I caved the cut in and went after my party to form a company. With my party I opened the lead and called it Comstock lode. We started to rocking with my water. I continued owning the claim, locating 1,400 feet for myself for the use of my water to the company." Comstock goes on to explain how he acted as good angel to the camp, and gave rich mines away right and left. "I located the Savage claim—showed the ground to Old Man Savage. I located the Gould and Curry—went into the valley and got old Daddy Curry to come down, and put him in possession."

The little drama was in truth very simple. Comstock, one of the most ignorant and bombastic of men, had managed by loud talk and pure impudence to make himself the most important personage of the epoch. He had never really found anything, but he claimed everything in sight. In a few weeks, when miners came from all points of Washoe, the most important man in the region was thought to be Comstock.

CHAPTER VII.

PLACER MINING ON QUARTZ LEDGES.

AGAIN the real problem presents itself to the discerning reader—When will these stupid people find out their own good fortune? Not until it is crammed down their throats, like a dose of quinine. That is already evident to any one who has followed the amusing career of this Peterkin family of stumbling prospectors, whose Dunciad of woes regarding troublesome silver float all the way up the gulches from Johntown has been almost beyond belief. The Grosh brothers, even admitting that their “monster vein” was some other ledge than the Comstock, would not have waited five minutes after the Gold Hill discovery before they had filed on the main lode for gold- and silver-bearing quartz, and in an hour they would have been sinking a shaft. Not so was it with these earliest Comstockers, who were mere survivals, mining autochthons of the placer-camp age.

Midsummer of 1859, therefore, became the placer period of the Comstock. The surface was rich beyond the wildest dreams of wandering Washoe prospectors. The steady thud of Johntowner picks, the swish-swash of their rockers, was heard at last in the midst of *débris* from outcroppings of the greatest mineral deposit in America. The miners were literally sleeping upon mounds of gold and silver. But even at this late moment, when the news of their discovery was speeding

over Sierras and Rockies to men who were wise enough to read the secret of the "sand of iron" and the "hard blue stuff" at a single glance, O'Riley, McLaughlin, Comstock, Penrod, and the rest were every day taking out from five hundred to one thousand dollars in gold to each man at work, and were throwing away several times as much in silver. Not one of them was able to rise to the occasion. The myriad-sided hints of the past had been wasted upon these fools of fortune.

Some local excitement occurred, of course. Ranchers came north from Eagle and Carson valleys, east from the lands about Washoe Lake, south from the Truckee meadows. A few herdsmen and prospectors arrived from the desert. Scattered miners in the gulches abandoned their claims and hastened to Comstock's diggings. But from all these sources not more than a hundred persons entered claims that summer along the lode or near to it. Talk of quartz was occasionally heard, but only of gold quartz; and as the deposit became more solid, cheap Mexican *arrastras*, run by mule power, were erected to grind lumps that were too hard to be broken with the handle of a pick.

Comstock was exuberantly happy for a few weeks. His Indians did most of the work, and all he had to do was to watch the sluice boxes and take visitors around. A party of ladies from Carson Valley were upon the claim in July, and, as is the custom in placer camps, each lady was offered a "pan of dirt" by Comstock, being expected to wash it out and keep the gold as a memento. The pans would have averaged forty or fifty dollars apiece, but Old Pancake had taken a fancy to one of the number, and so he slipped in a large handful of "dust," giving her, as tradition states, more than three hundred dollars. Comstock was wildly avaricious when mining, and as wildly extravagant

with his gold when obtained. He bought whatever took his fancy, and gave it away the next minute. His only pleasure seemed to be the spending of money, and most of his comrades were very much like him in this particular.

Pleasant Hill Camp was the first name given to the settlement at Ophir, and some called it "Mount Pleasant Point." Ophir and Ophir Diggings were also names used for a time. By August there were a dozen tents, dug-outs, or shanties on the present site of Virginia City. The name Winnemucca was then suggested as preferable to the earlier titles; but one midnight Old Virginia, going home with the boys and a bottle of whisky, after an unusually protracted revel, fell down when he reached his cabin, broke the bottle, and rising to his knees, with the bottle-neck in his hand, hiccoughed, "I baptize this ground Virginia Town!" A reveller's shout arose, and it was decided to return to the saloon and celebrate the new name for the rest of the night. It took at once, although "town" was soon broadened to "city." Under every one of these titles the place was recognised almost from its foundation as the most important town in Washoe district. Still, there was no hotel, and only one small restaurant. Newcomers brought their blankets and slept in the sage brush on the treeless hillsides.

Gold Hill, it will be remembered, was located by four men, five others coming in later. Only one of the nine managed to retain his interest for any length of time. Old Virginia gave "Little French John" nine feet of his claim. He sold the rest of his claim of fifty feet at fifty dollars a foot. Big French John and the rest sold some time after at prices ranging from fifty to one hundred dollars a foot. Rodgers com-

mitted suicide. Old Virginia, while on a spree in 1861, was thrown from a horse and killed. All of the original Gold Hillers speculated, spent the money they made, and died poor, while fortunes were being taken from the ground they had owned.

The North End discoverers were no more fortunate. McLaughlin sold for \$3,500, a few years later was cooking for a gang of men for forty dollars a month, died a pauper, and was buried at public expense. Penrod sold for \$8,500 toward the close of the year, and soon spent all his money. Osborn, who had obtained a sixth interest in the Ophir by building a seventy-five-dollar *arrastra* for the company, sold for \$7,000, and Winters did no better; both men were poor a few years later. O'Riley hung on longer than any one else—even Comstock—and so received \$40,000. This he spent in stock speculation, and finally died in an insane asylum.

Comstock himself, who belonged to both camps, was even more typical of his kind. Two months after the ledge was struck he sold all his interests for \$11,000. He lost every dollar he had, came back to the Comstock, found better men everywhere, wandered off on lonely prospecting tours in Nevada and the Rockies, and finally committed suicide in Montana. His petty schemes among his fellows, his simple egotism and bombastic lavishness, his brief authority as father of the camp, his failure to seize the unparalleled opportunity, his return to pick, pan, and prospecting horn, his death under the cloud of partial insanity—all these are among the dramatic elements of this strange life history.

So had this group of prospectors remained wholly unteachable, clinging to their folly, rejoicing to be able to sell their claims for comparative pittances.

Like the classic fool of Proverbs, Comstock and the rest of them had been brayed as in a mortar, but their folly remained. These men had in their undisputed possession wealth enough to have made each one of them richer than the late Jay Gould. Comstock, had he risen to the opportunity, might soon have flashed across the skies of London and Paris the greatest speculator of the century, another John Law, running printing presses night and day to supply the demand for Nevada mining stock from claims staked out across Flowery Ridge and miles beyond in the desert. As it was, each one of them believed he was receiving more than his interests were really worth. They had never understood the slowly accumulating evidence pointing to the Comstock lode as a great storehouse of mineral wealth. Others also, who followed them, undervalued opportunity, and yielded in time to the old law of the survival of the strongest, but none could again give so much for so little.

Thus the placer period comes wholly to an end in falsely shrewd bargains. The goddess, so long wooing these stumbling men, tires at last and turns away with laughter in her eyes. Beyond the Sierras, in the forests where the body of Allen Grosh lies, there is the sound of an advancing army, and thither the goddess looks, choosing new favourites. Already those whose day is done are forgotten.

CHAPTER VIII.

THE RUSH ACROSS THE SIERRAS.

THE first news of the mines that was heard west of the Sierras made many persons think that the district contained only shallow placers. Settlers along the eastern slope of the mountains, from Honey Lake to Carson Cañon, did not hesitate, but poured into the new gold region. One of them stood by and saw "the famous Mr. Comstock and Old Gentleman Virginia" take out \$1,900 in placer gold in one day.

At Nevada City, California, in the midst of one of the most permanent quartz-mining districts of America, the discovery was made that caused the great silver rush. A plain Truckee farmer named Harrison rode over to the diggings quite early, when Virginia City consisted of only two tents. He saw Long John Bishop and his partners throwing away masses of "blue stuff," and they told him it was worse than useless. Picking up a few pieces, he carried them home, and afterward to Nevada City. The problem had at last reached a set of men who were in the habit of investigating what they did not understand. The two best assayers in the town tested the fateful "blue stuff" and demonstrated that a ton of it was worth \$1,595 in gold and \$4,791 in silver, or a total of \$6,356. This was the base metal so long thrown away by the guileless and ignorant miners of Western Utah! Tons and tons of it were said to be in sight in the "cut" of the

Ophir, on the hillside below, and at the Yellow Jacket.

Harrison, the inquiring rancher, appears to have gone back to his wheat fields, but though it was nearly midnight before the value of the rock was known, half the people within a radius of five miles had the story before breakfast time. Then the miners assembled to talk the matter over, and found that two of the best men in the district, Judge Walsh and Joe Woodworth, had loaded a pack mule, saddled their horses, and started long before daybreak for Virginia City. They could not have travelled faster if a score of *vigilantes* had been on their track. This rapid stroke of energy was like a match thrown into gunpowder. Hundreds of miners left their claims and began to pour over the mountains on foot, on horseback, or in wagons, hewing out new trails and roadways.

It should be explained that the Pacific coast had long been a region of periodical mining excitements. Away back in 1852 it was reported that the ocean was washing up gold on the beaches of Humboldt County—so much, in fact, that, as Ross Browne said, it was generally believed that any enterprising man could take his hat and a wheelbarrow and in half an hour gather enough gold to last him for life. A year or two later the Kern River rush nearly depopulated the northern half of California, and for three hundred miles the dry and dusty plains were fairly spotted with thousands of eager prospectors and speculators; most of whom returned, like the Gold Bluffers, ragged and penniless. Next came the still more memorable rush to Fraser River, British Columbia. Farms were abandoned, crops rotted in the fields. Thirty or forty thousand Californians poured into English territory, when suddenly the gold gave out and the miners returned

disconsolate. Every one had said that now, at last, there was an end to such sudden excitements; it would be impossible to impose again upon public credulity and upset the commercial progress of staid communities. Suddenly the air rang with a new cry, "Washoe! Washoe!" and the old Forty-niners were ready for the adventure.

Only a part of the great Washoe rush came in 1859, for the season was too far advanced. But as soon as reports from those who first crossed the mountains came back to the California settlements, men went wild with excitement. Judge Walsh, on the 12th of August, had managed to buy out nearly the whole Comstock group of claims, and Joe Woodworth also "got in on the main lode." Men of every type and nationality crowded the mountain roads and staked out prospects on every hand.

A correspondent of the Sacramento Union, writing from Ophir Diggings, October 22d, reported that the total yield of the half-abandoned Gold Cañon claims for 1859 was \$24,000, obtained by forty miners working one hundred and twenty days. Fifty Chinese miners in the Carson River placers obtained about \$35,000 the same season. Of course the above does not include Comstock returns, excepting a very little of the first placer yield there. But, according to figures published in the Californian newspapers late in 1859, "Ophir, Central, Mexican, and Gold Hill" claims had yielded \$275,000 before the winter storms prevented further work.

One of the most severe winters ever known in the region now followed, five or six feet of snow falling in Virginia City. Firewood was very hard to obtain, and the tents and huts of the pioneers were extremely uncomfortable. Many lived in "dug-outs," which they

called "holes in the wall." All outside communications were cut off. Cattle, horses, and animals of every kind perished from cold and starvation. The Indians of Washoe suffered greatly, and many of them perished. Flour was worth seventy-five cents a pound, and hardly anything eatable was any cheaper.

Some were glad to get away in the spring of 1860, abandoning their claims as not worth such a struggle, but the great majority were wild with the passion for sudden riches. The small backward eddy was met by the vanguard of a still vaster army. Long before the snow was sufficiently melted to render the passage of the Sierras entirely safe, multitudes were forcing their way across.

The severity of the winter of 1859-'60 had caused such high prices at the new camp that every effort was made to get goods in early. Before the end of February mules laden with supplies were led for miles on blankets spread over the snow to prevent them from sinking. The journey at that season was like crossing the Alps in midwinter. Forgotten heroes of the long battle of the frontiersman with the wilderness toiled on and up, over the ice and snow of the Sierra passes, seven and eight thousand feet above the sea. A hundred and sixty-two miles was the entire distance from Sacramento by Placerville, the main route, but forty miles of this was comparatively easy. Then the ascent began, first in the warmer foothills, but very soon in slush and snow. Saddle trains were started for passengers before any vehicle could get over the passes, where the snow in some places lay fifty or sixty feet deep. Sleighs were tried, but the deeper drifts alternated with bare, wind-swept rocks. At the earliest possible moment stages began to run, some by Truckee, others by Placerville.

The advance guard of the army of prospectors

and speculators reached Placerville to find further movement prevented by a snow blockade. Hundreds of tons of freight lay on the hillside, though a dollar a pound was freely offered to any one who would get it over the mountains. More freight was surging night and day toward the congested streets of Placerville. The steamers from San Francisco to Sacramento were "reeling under loads of Washoe freight," to quote from a correspondent of the San Francisco Bulletin in March; their deck loads consisted of sprawling figures discussing the Washoe Mecca in a dozen different tongues. Merchants closed their stores; clerks left their desks and teachers their schools; sailors slipped overboard and swam ashore to join the silver seekers; mechanics threw down their tools, and farmers abandoned their fertile ranches in the broad California valleys. Bars of white bullion, the first silver from Washoe, were piled in bank windows, or followed by admiring crowds through the streets, arousing and increasing public interest.

One shrewd trader named Moore came to the front. Having a few dollars to invest, he left San Francisco March 9th with two hundred pairs of blankets costing two dollars a pair, twenty dozen tin plates costing twenty-two cents a dozen, and a large assortment of liquors. He managed in some way to obtain pack mules, so that he reached Virginia City on the last day of March and sold two hundred dollars' worth of drinks before nightfall. Forty men paid him a dollar apiece per night for the use of blankets and space enough in his tent to sleep in. Moore refused eight thousand dollars for his goods, which had cost him less than one fifth as much. The next trader to cross the mountains retailed some shovels for nine dollars apiece.

A letter written April 5, 1860, to the Mountain

Democrat, of Placerville, describes most vividly the condition of things as they appeared to one of the first arrivals of the season who had fought his way over early in March, even before the arrival of the Moore party. "There are few houses in Carson Valley," the prospector writes. "I have seen only about one acre of ploughed land." He describes the "Washoe zephyrs" that blew day and night from the snow peaks, and adds that there was a foot of snow on the ground and a snow-storm in progress. At the time of writing, lumber "was selling for four hundred dollars per thousand." Eight or ten small buildings were being put up. Canvas, boulders, and dried hides were used to save lumber. The business of the town appeared to be "eating, sleeping, drinking, and gambling." Wages were five dollars a day, but meals and shelter cost four dollars. Though many men were said to be millionaires, it was merely by reason of estimates of the value of their claims.

This was probably a very truthful statement of the condition of affairs in the spring of 1860, but wildly exaggerated statements had gone abroad, as in all mining excitements, in which most persons appear to entirely lose the power of distinguishing truth from falsehood. It was commonly believed in San Francisco that many and large *arrastras* and quartz mills were turning out tons of bullion, when in fact all that the miners could do in that line in the fall of 1859 was to build a few small mule-power and two water-power *arrastras* on the Carson River that pulverized two or three tons of rock a day. The loose, decomposed surface rock was exhausted.

This was the time when the old crowd rejoiced audibly that they had sold out before the new diggings were exhausted. Alvah Gould, who sold his half in-

terest in the "Gould and Curry" for four hundred and fifty dollars, and twenty years later was keeping a peanut stand at Reno, went galloping down Gold Cañon immediately after the sale, shouting, "I've got away with the Californians!" The whole country was crossed by such a network of quartz ledges that very few persons looked upon the Comstock group of claims as any more valuable than hundreds of others.

The picturesque features of this great affair, the famous rush of 1860, have never been more pleasantly illustrated than by a series of papers entitled "A Peep at Washoe," which first appeared in Harper's Magazine. Written by that genial and accomplished Californian, the late J. Ross Browne, they abound in unfailing humour and clear-cut common sense. No writer of the time better knew how to use his material, and he had the spirit of an almost ideal newspaper reporter. He went to Washoe among the earlier pilgrims, "roughed it" in a truly refreshing manner, and reproduced with pen and pencil exactly the essential elements of the scene.

Ross Browne, as every one called him, reached Placerville by stage from Sacramento with "two pair of blankets, one extra shirt, a plug of tobacco, a note book, and a paint box." The roads beyond Placerville were so bad that the stages had just been taken off. The town was therefore full of pilgrims anxious to cross the mountains, and "practising for Washoe" in the saloons and gambling places. Every sign bore "Washoe" in large letters. Pack trains were starting daily for the mines. The livery stables had their horses and mules engaged a week in advance. The town was full to overflowing. Men who could not get beds slept on the floor. There was nothing but Washoe to be thought of or heard of; Smith "had made ten

thousand dollars there at a single trade"; Jones "had found a twenty-thousand-dollar mine" the day he arrived; and Robinson's canvas hotel was "worth forty thousand to him." Browne revelled a while in all this tumult; then, finding it impossible to obtain anything to ride, he joined a party of four who were starting on foot. They filed along the ravine that formed the main street of Placerville, with their blankets and provisions strapped on their backs; the crowd shouted "Go it, Washoe!" and they departed up the grade toward "Strawberry Flat."

It was April, and the track was furrowed with disaster. Broken wagon-tongues protruded from the mud. "Loads of dry goods and whisky barrels lay wallowing in the general wreck of matter." Along the worst parts of the cañons whole trains of pack animals "struggled frantically to make the transit from one dry spot to another," or rolled headlong to the bottom of the gulch. The cries and maledictions of the Mexican *vaqueros* were terrific. Browne makes a faint attempt to describe it as follows: "Carambo! Caraja! Sacramento! Santa Maria! Diavolo!"

Nightfall overtook the five wayfarers at "Dirty Mike's," a shanty with a bar and a public bedroom, where they spread their blankets. The furniture consisted of a piece of looking-glass on the window frame, and the public comb hanging by a string from the doorpost. Supper consisted of coffee, beans, and potatoes. The plates, like the landlord, had seldom seen water.

As the travellers proceeded on their way the next morning they were more and more impressed by the unique features of the great rush of which they formed a part. "Taverns of dry-goods boxes and old potato sacks," board-and-lodging signs over tents scarce ten

feet square, saloons where the whisky barrel set in the shade of a pine tree formed the bar—such were common scenes along the road. They were never out of sight of pilgrims—Irishmen with wheelbarrows; American, French, and German miners with tools and heavy packs; Mexicans with burros; gamblers and confidence men on valuable thoroughbreds; Missourians struggling through the mud with their families and household goods in lumber wagons; drovers with hogs and cattle; organ grinders, Jew peddlers, “professors” with divining rods and electric “silver detectors”; women, even, dressed in men’s clothing and usually under some gambler’s protection. One saw youth and strength, illness and old age, cripples and hunchbacks—“all stark mad for silver.” Weather-beaten, footsore, a counter-current of defeated, heart-broken men who had already seen too much of Washoe went slowly past, but none of the silver hunters paused. A few among the returning crowd looked prosperous, and tried to sell shares of stock in various Washoe mines to the newcomers. One of them was positively happy. He had taken a grindstone to the Comstock the previous autumn and made thirty dollars a day, as long as the stone lasted, grinding tools. Now it had worn to the middle, and he was on his way to Placerville to buy another.

Before dark three of the party had gone ahead of Mr. Browne, and one lagged in the rear nearly exhausted. Poor Browne pushed on to Strawberry Flat, about forty-five miles from Placerville, with a solution of paints and tobacco running down his legs as he walked through a driving rain. The famous “Strawberry Hotel” was a large log house, with every room and shed crammed full of treasure seekers. A door opened, the fortunate ones hurled themselves into

the dining room, filled it, ate ravenously, and were driven out like cattle to give place to an equally hungry horde. Eight or ten times this process was repeated, and by the time Mr. Browne had taken his turn in this *mêlée* the "general bedroom" was filled by some three hundred tired wayfarers. Forty or fifty remaining pilgrims occupied a room about eighteen feet square. In the morning Mr. Browne found that his stockings had been stolen, a very serious loss when one was about to climb the Sierras.

The third day was wasted in a futile attempt to reach Lake Valley, and the fourth day's experience was even harder than its predecessors. The poor pedestrian, carrying thirty pounds or so, slid, slipped, rolled, and climbed along the winding trail, which "was perfectly honeycombed with holes." Lake Valley station was reached (Lake Tahoe) through the process of sliding down sections of the grade. Accommodations here were so poor that Browne decided to push on to Hope Valley, four miles distant. The weary traveller found the deepest and most adhesive of moist clay, but overtook three more pilgrims, and they tried to find shelter in the cabin of "Diogenes," as they named the only settler in the valley, a rough customer who sat on a pile of fox skins just inside his door holding a savage bulldog. Diogenes wanted no company, would sell nothing, and did not care if any number of Washoe tramps died on his doorsteps. The discouraged quartette went on to Woodford's, six miles farther, in the face of blinding sleet and a terrific wind. This station, a log cabin, was on the Utah line, and, as everywhere else, several hundred people were trying to get a little food and sleep.

The fifth day brought the traveller into the desolate sands of Carson Valley, where his feet were so blistered

that he made only fifteen miles by sunset. Finally he felt unable to take another step, when he perceived a hot spring close by, toward which he crept. Finding the water saline, he bathed his feet, and was soon able to resume his journey.

The sixth day our hero proceeded by slow degrees to Carson City, and took the stage a few days later to the mines, eighteen miles distant.

A few weeks later, broken down by overwork and exposure and poisoned by bad water, he started back across the mountains. Another snowstorm had blocked up all the trails, and he was compelled to walk most of the way. "A perfect torrent of adventurers" was pouring over, forming an almost unbroken line "from Placerville to Carson City." He thought that almost the whole State of California was on the move to storm the Washoe mines. In vain he expostulated with prospectors, and said that though there were already eight or ten thousand people in Virginia City, not one man in fifty had either mines or work. Every one laughed and pushed ahead, determined to see the elephant for himself.

I have told Ross Browne's experiences in my own way and with considerable detail, because they appear to me typical, though much less severe than those which fell to the lot of many of the passionate pilgrims who were so wild to reach Washoe. The judicious reader will be able to infer that the settlement of an isolated mining district sometimes involves desperately hard work and reckless expenditure of energy. The fact is, no one who has not seen it is able to fully conceive of the nature of the struggle that goes on ceaselessly, remorselessly, in such epochs as the one under consideration. This very summer the rush to Alaska left hundreds of penniless wretches, who were totally

ignorant of pioneering work, in starving groups along the sea-coast, and they were gathered up by various relief expeditions.

In the midst of the excitement, while Virginia City was growing like a mushroom, the news of an Indian massacre was brought to the camp. The story was that the Piutes had attacked a stage station twenty miles away, had killed the men who kept it, and had burned the cabins. It was really some young men of the Bannock tribe who, aroused by terrible outrages, had killed the guilty men; but a company of one hundred and five volunteers from the mining camps started hastily for the main Piute settlement at Pyramid Lake to "teach the scoundrels a lesson." In the battle which followed, the whites suffered one of the most complete defeats on record. More than half were killed, and the scattered fugitives fled back to the towns, saying that the Piutes were coming with five thousand warriors. The excitement in Virginia City was tremendous. Martial law was declared. A rude fort was built for the women and children. Water pipes were melted into bullets. Watchmen were placed on the hilltops. A cry for help was sent across the mountains, and the California militia and regulars soon marched against the Indians, who were defeated and driven into the desert. It is the opinion of most students of the affair that the trouble was entirely unnecessary, but from a purely literary point of view it seems to belong exactly where it happened—in the midst of the great "Washoe rush."

Twenty thousand people went to Washoe in a few months, and half of them remained there. Other thousands followed and scattered out to new camps, until the movement inaugurated by Judge Walsh when he saddled his mule at midnight and slipped out of

Grass Valley, bound for the new silver camp, became the definite settlement of a new State. Among the Californians who came early were James G. Fair and John W. Mackay, unnoted in the throng. There were to be many successive dynasties of "kings of the Comstock" before the names of either of them should be heard abroad.

Through 1861 and 1862 the rapid transfer of men and money to Nevada continued, but splendid mountain highways were constructed by that time, and the story of the Comstock was presenting new elements of surprise. The real romance and heroism of the episode belongs, as in California, to the first two seasons after the rush began. The years 1859 and 1860 in Nevada history correspond to the years 1849 and 1850 in California history. Both periods alike witnessed a marvellous movement into the wilderness—one for gold, the other for silver. The social and financial relations of the two communities—one west of the Sierras, the other east—have been very close at all times, but the people of Nevada soon developed characteristics of their own. A Californian, after dwelling a decade or two in the sage brush and desert, became a Nevadan, much as the Virginian of the last century who crossed the Alleghanies into the land beyond became, in the course of a generation, a Kentuckian.

CHAPTER IX.

OLD TIMES IN VIRGINIA CITY.

IN a new mining camp all things start at once into feverish activity. Mines must be opened, mills built, roads and telegraph lines constructed, towns created and supplied. Prospectors are at work; speculators are buying and selling. New industries of every conceivable description are springing into existence. Nothing is considered done for "good and all." Within a month after a building is roofed over it may be torn down so that a larger one can take its place. All these things are simultaneous to a degree that no narrative can hope to rival. Though scattered into chapters for the sake of convenience, it must be remembered that the story of the first busy year or so in the Comstock towns is in reality but one great event—one mingled picture of pioneers, prospectors, speculators, town builders, underground miners, silhouetted against Mount Davidson.

When the "surface diggings" began to pay in the spring of 1859 the first effort of the miners, as in nearly every case on record, was to organize in some rude, simple manner for the better protection of life and property. In a historical sense, this was a mingling of the two currents of political development—the unsatisfied desire of the settlers of Western Utah for a separate territorial government, and the transplanted system of camp "rules, usages, and customs" that had

been created a decade before in California. A few ranchers in Honey Lake Valley had already organized the "Territory of Nataqua," which finally led to the "Sage Brush Rebellion" of 1862. A larger group of ranchers in Carson and Eagle Valleys were taking steps for the formation of a provisional government for the proposed "Territory of Nevada." Meanwhile the men of the new camps were not only sending delegates to the ranchers' convention, but were adopting local regulations.

On June 11th, at Gold Hill, a miners' meeting made the following rules: That no Chinaman should ever hold a claim in the district; that all "banking games" should be prohibited and professional gamblers banished; that theft or robbery is to be punished by stripes or banishment, as the jury may determine; that the penalties for assault and battery or "wilful wounding" should be fixed in the same manner; and, lastly, that murderers should be hung. Gold Hill had had one homicide in April, when the first house was being built, two of the miners having quarrelled in a game of cards, and the survivor was on trial at Carson City at the time of this miners' meeting. The affair caused the adoption of a mild regulation against "exhibiting deadly weapons." To prohibit carrying them was evidently a refinement of law entirely beyond the pioneers.

Nearly all the miners did their own cooking, but as slapjacks, beans, bacon, and coffee constituted the usual programme, their task was not very difficult. Hotels and restaurants, such as they were, charged too much, and so the newcomers secured some kind of shelter and the regulation coffeepot and frying pan as soon as possible. Blankets were of primary importance. Picturesque costumes and a general air of being

engaged in a summer outing have existed only in the minds of romantic writers and artists of mining camps. Coarse, cheap clothing, dirt and rags, are really the salient features. The Comstock miners were compelled to do their own mending and patching as long as flour sacks lasted, and as leather belts were generally worn, buttons were never of much importance.

For some months the only way to carry goods to Virginia City was on mule-back, and the few boards in the camp were taken there in this manner from Washoe and Genoa sawmills. Firewood was scarce and costly. The nut-pine trees were soon cut down; Indians grubbed up the roots and sold them to the miners. Sage brush was burned a good deal, but still many people were not able to afford the luxury of a fire except for cooking. Tunnels, run into the hills and widened into one or two rooms, became very popular for winter residences. Some miners cooked in a brush hut outside; others cut a shaft for a stovepipe, and the hillside sometimes smoked as if a dozen small volcanoes were in active operation. One large cave accommodated twelve or fifteen men. A Scotchman near Silver City made quite an underground dwelling in a hill of rock. He was widely known as the "Nevada Hermit," and passed most of his time reading in a library of several hundred volumes, which occupied one of the rock-hewn chambers. Sunday afternoons he used to receive visitors and read sermons to them.

Virginia City, however much it needed sermons, got none in those days. The shapeless town, crossed at various angles by three straggling lanes, had no social life except in the saloons and gambling houses. Cheerful, well-lighted, full of excitement, these were the real homes of the miners. Gold and silver were stacked up on the *monte* tables; dice rattled and cards

were shuffled all day and all night. The ragged, greasy, dirt-covered multitude filled the saloons with loud talk and laughter, except when a pistol-shot rang out sharply and the crowd swayed into the street. Lyman Jones's canvas hotel, eighteen feet wide and forty feet long, was one of the first of these saloons. The "bar" consisted of an old sluice box and the bar fixtures were a pitcher and a dozen tin cups. Another bar was made of the side of a wagon box, carried up the gulch on mule-back.

Winter weather in Virginia City, or rather the extent and variety of it, considerably astonished the newcomers of '59, and was even a surprise to those old-timers who had been living in the more sheltered ravines. Some kinds of the weather were much worse than other kinds, but all were execrable. One writer remarked that "Washoe has no climate of its own." All it has "is blown over the Sierras from California and comes in fragments." Several avalanches occurred after thaws in the winter. Some miners were dug out with difficulty, and one or two persons lost their lives.

None of these things were so terrifying to the pioneers as the gales, or "Washoe zephyrs" which plunge furiously downward from the crests of the snow peaks and sweep in wild eddies and whirlwinds of terrific force about Mount Davidson. A man's hat is sometimes carried from his head, lifted a hundred feet vertically, and then dropped, a twisted mass, at his feet. Such a wind rips boards, shingles, and sheets of tin from buildings, tumbles stovepipes and chimney pots down the gulches, and fills the air with flying gravel. When the miners founded Virginia City they knew little or nothing about the zephyrs, and nearly every shanty, tent, and hut was blown out of sight after

a few gales. Two of the first churches built were blown flat. Tradition relates that during those early gales the air was filled with rags, empty cans, bottles, crowbars, pickaxes, cooking stoves, cats, and Indian babies. One veracious chronicler says that a donkey was once caught up from where he was grazing on the side of Mount Davidson and blown eastward over Virginia City at the height of six hundred feet above the town, finally landing at Sugar Loaf Mountain, several miles away. The eyewitnesses aver that as the poor beast was hurried over his master's cabin "his neck was stretched out to its greatest length, and he was shrieking in the most despairing and heartrending tones ever heard from any living creature."

In the spring of 1860, when excitement was fairly boiling over, a visitor wrote the following terse description of the "wondrous city of Virginia," and nothing could better serve to sum up its appearance: "Frame shanties pitched together as if by accident; tents of canvas, of blankets, of brush, of potato sacks, and old shirts, with empty whisky barrels for chimneys; smoking hovels of mud and stone; coyote holes in the hillsides forcibly seized by men; pits and shanties with smoke issuing from every crevice; piles of goods and rubbish on craggy points, in the hollows, on the rocks, in the mud, on the snow—everywhere—scattered broadcast in pell-mell confusion, as if the clouds had suddenly burst overhead and rained down the dregs of all the flimsy, rickety, filthy little hovels and rubbish of merchandise that had ever undergone the process of evaporation from the earth since the days of Noah. The intervals of space, which may or may not have been streets, were dotted over with human beings of such sort, variety, and numbers that the famous ant-hills of Africa were as nothing in comparison. To

say that they were rough, muddy, unkempt, and unwashed would be but faintly expressive of their actual appearance; they seemed to have caught the diabolical tint and grime of the whole place."

Few mining camps have been so utterly neglected by the civil authorities as was Washoe. The people kept appealing to Congress to set them apart in a new territory, or join them to California. Lawbreakers soon drifted in, and the miners' honest efforts to preserve law and order became of little value in the wild scramble. Parasites and desperadoes, the classes that curse every prosperous camp, were often among the first that arrived. The miners' courts, as a rule, paid more attention to offences against property than to those against life. Two of the early thieves were tried under a pine tree; each had an ear cut off, and the men were driven out of the district. But there was no law for the bullies, the "Big Chiefs" as they were called, who terrorized the busy town. As Mr. Eliot Lord says in his graphic book, *Comstock Mines and Miners*: "They lolled on gambling tables and the bars of saloons, and swaggered about the city at all hours of the day and night."

Every one has heard of the "Tombstone Terror" and the "Bad Man from Bodie." The type has gradually become semi-humorous; an alliterative Terror is robbed of half his dreadfulness, and becomes a cheap, theatrical, amusing villain. Not so in the old Comstock days of "Big Chiefs," the most of whom were plain and prosaic scoundrels too long unhung. One, Sam Brown—heavy-voiced, burly, insolent—had killed thirteen men in Texas and California before he reached Washoe. He kept a station on the Humboldt for a time, and once when a traveller desired something to eat, Brown pointed to a piece of bacon. The traveller having

no knife, asked for one. Brown pulled out an immense bowie, then thrust it forward with the remark that he had "already killed five men with that knife," and the startled visitor fled in haste.

Brown on one occasion in Virginia City took offence at some remark made by a poor half-witted fellow. Without a word he seized his prey and slashed him to pieces with the terrible bowie. Then he lay down on the billiard table and went to sleep while the remains of the victim were being gathered up from the floor. This incident and several others quite as bad are well authenticated in the history of the rampant ruffianism and crime of the period. Sam Brown's long list of murders came to a sudden end when a plucky rancher whom he had threatened to kill on sight filled him full of buckshot.

A few "gentlemanly cutthroats" of rather more prepossessing appearance were occasionally found—men like Cherokee Bob, of Oregon and Idaho, the undoubted original of Bret Harte's Jack Hamlin. One of these, "El Dorado Johnny," desiring to shoot a man, bought a new suit of clothes, got shaved, had his hair curled and his boots polished, saying that he might be "used up" and desired to "look nice if he was killed," which was exactly what occurred.

As Virginia City, Gold Hill, Silver City, and other towns grew in size and wealth, thieves, rowdies, and footpads appeared to increase in numbers faster than the respectable, hard-working portion of the community. After a while robberies were of almost daily occurrence. A good many murders are supposed to have been committed during the reign of this lawlessness and when the country was full of strangers. Still, there never was anything like the amount and degree of out-lawry in Nevada that there was at a later period in Mon-

tana, where the evil characters of the whole Pacific coast gathered, and went down at last before the stern justice of the *vigilantes* of the Rockies.

Before the close of 1860, as already sufficiently indicated, Virginia City had all the vices of large mining camps. Women of nameless reputations paraded the streets in gay attire and jewellery. The Sacramento Union sent a correspondent to the mines in September, who drew especial attention to the cosmopolitan character of the place—Italians, Frenchmen, Germans, Mexicans; each class was so well represented that all had favourite resorts. The first theatre was opened September 29th by a travelling company from Salt Lake that played Toodles and Swiss Swains and won a mighty reward in hard cash. Wandering barn-stormers were probably never more surprised at their reception.

Let us turn to another side of the picture. Heroes and lovers of humanity were in the camp, toiling to organize schools and churches and to create a civilized social life. All the leading religious denominations were soon represented, and some had small churches within a year or two. Noble Father Manogue, himself a miner in his youth and a man of endless pluck and zeal, did a marvellous work among the rough characters of the frontier. A Methodist, Rev. Jesse L. Bennett, preached the first sermon ever heard on the Comstock. It was delivered on the corner of C Street, and when the hat was passed after the services it came back “nearly filled with gold and silver.”

Pioneer Comstock reminiscences are crowded with Piute stories. The Indians were good-natured, industrious, and seldom difficult to manage. Old Chief Winnemucca was an able diplomat, and many of his braves were fine hunters and guides. A great deal of the rough work of the period in mining and lumber-

ing was done by the Indians. In Wright's Big Bonanza the following conversation occurs with an old Piute:

"When me first come here, no house here; all sage brush. Me work here, first time me come, for Ole Birginey, down in Six-Mile Canyum."

"At mining?"

"Yes, minin'. Me heap pull rocker. Me that time know Comstock, Ole Comstock. You sabe him?"

"Yes, I have seen him. He is dead now; got broke up in Montana; bad luck all the time; got crazy; shot himself in the head with a pistol."

"Hum! Ole Comstock dead! Well, Ole Comstock owe me fifty-fi' dollar. That money gone now. Well, same way Ole Birginey. He owe me forty-fi' dollar when he die. He down to Dayton long time ago. One day he bully drunk, he get on pony, pony he run, drag ole man on the ground and kill him. Me help dig one grave, down by Carson River."

A mining country is always dangerous to walk around in, for there are hundreds of abandoned prospect holes and shafts in the most unsuspected spots, perhaps overgrown by weeds and bushes. Many a poor fellow looking for a fortune has "mysteriously disappeared," and ten to twenty years later his bones have been found in some forgotten pit. Within a year or two after its settlement the country around Virginia City was fairly honeycombed with worthless shafts that served only to trap wild animals, goats, donkeys, horses, cows, and occasionally an unlucky miner. It added new terrors to the Comstocker's privilege of getting drunk and going home "across lots."

Old Virginia City people tell innumerable stories about these abandoned shafts, relics of the great rush. In one case a man started to look up his goats, and found footprints leading into an old tunnel. He ventured in,

and fell into an eighty-foot shaft which had been sunk in the tunnel. The bodies of several goats helped to break his fall, and after some hours his neighbours tracked him to the place and rescued him. The engineer of a Silver City mill was once found bruised and insensible lying in a shaft in Virginia City, where he had remained for three days. There is another story about a teamster who unhitched eight yoke of oxen, leaving them connected together by the long log-chain and let them browse around while he cooked his dinner. Pretty soon he saw them bunch together and disappear in a three-hundred-foot shaft which had been covered with a little brush, hardly enough to hold up a good-sized dog.

Speculation was of course universal. While hundreds of claims of every description, located immediately after the first silver discoveries, were still buried under the snow, the owners were pleased to claim and the public to believe that each one of them was as valuable as the Ophir. These "wild-cats," as they were afterward called, were bought and sold with increasing energy for months. The actually incorporated companies formed during 1859 and 1860 numbered thirty-seven, with a capital stock of \$30,040,000. The incorporations of 1861 numbered forty-nine, with a stock capital of \$31,462,000. No one knows how many thousands of claims besides these were put on the market in those years. Time sifted out the worthless claims and incorporations until only a few were left. The first incorporation, Ophir, soon increased its capital stock to over five million dollars, Gould and Curry came next with \$2,400,000, and so it went. At the time of Ross Browne's visit in 1860 he made an estimate of the companies who "claimed to hold" in the Comstock vein. There were nineteen, claiming a total of about twelve

thousand feet, and Billy Chollar held the largest slice. Prices ranged from two hundred to two thousand dollars per foot. Only five or six of the names familiar to stock boards appear in the list.

Of "outside claims" Mr. Browne reports "about forty miles said to be on a direct line with the Comstock," and to be richer, if possible, than the original vein. Even the desert was "pegged like the sole of a boot" with claim stakes. "Indications" being once found in a Virginia City cellar, the whole town site was torn to pieces and covered with conflicting claims.

The miners had long before provided, after a fashion, for a recorder of claims, and had elected an honest but illiterate blacksmith of Gold Hill, V. A. Houseworth by name, whose book of records and memoranda is now one of the official treasures of Storey County. It was Houseworth's guileless habit to keep pen, ink, and the old blank book on a shelf behind the bar of an adjacent saloon. When miners came in to register their claims they went to the blacksmith shop, and the crowd adjourned to the saloon. Says Dan De Quille, "The 'boys' were in the habit of taking the book from behind the bar whenever they desired to consult it, and if they thought a location made by them was not advantageously bounded they altered the course of their lines and fixed the whole thing up in accordance with the latest developments." It afterward became evident in the course of many a tedious and costly lawsuit that the miners who tore out leaves, altered dates, and changed the records as they chose, had made endless trouble for themselves and for the district.

Wells and Fargo's Express Company, which has helped to develop almost every mining camp on the Pacific coast, opened an office in Virginia City in the

very first days of its existence; but for a time at least the owners of Ophir and one or two other claims banked their gold dust with Lyman Jones, who kept it "without charge and without responsibility" in a dry-goods box under his bed, where twenty or thirty thousand dollars often reposed until the mine owners were ready to pay it out again.

The problems of early transportation necessarily included mails before the days of stage coaches. Snowshoe Thompson continued to carry letters across the mountains every winter. He even carried type in this way for the first newspaper in Virginia City. In summer time, after 1858, the regular overland stage carried mails twice a week along the Carson Valley. In April, 1860, the famous Pony Express was established across the continent. Its quickest time was 1,780 miles in five days and eighteen hours; stories of its lonely stations and its fearless riders are among the most attractive of frontier traditions.

That curious and vivid Western phrase, "grapevine telegraph," originated in 1859. Colonel Bee constructed a telegraph line between Placerville and Virginia City, attaching the wire to the trees; their swaying stretched it until it lay in loops on the ground, resembling the trailing California wild grapevines. Frequent breaks occurred from falling trees and avalanches, till the line became almost useless, being sometimes beaten into Sacramento by the Pony Express. California and Nevada newspapers took it up, and whenever a journalist wished to cast doubts on the freshness of his opponent's news he forthwith accused him of running a grapevine telegraph. But in the spring of 1861 the Overland Company pushed into the Sierras and successfully connected Virginia City with Sacramento by a modern telegraph wire on poles.

A little later in point of time, but still belonging in essence to the pioneer period, was the noted "Rowdy Fund." The Territory of Nevada was organized by act of Congress, March 2, 1861, and a superintendent of schools was then appointed. Pioneer schools supported by individuals were already in existence. Virginia City contained only two or three children of school age at the time, seventeen in 1862, and three hundred and sixty the following year. At Carson City a characteristic incident occurred. The town boasted of a small theatre, and one night two "prominent citizens," full of whisky and bravado, swaggered down the main aisle, drew their revolvers and bowie knives, and ordered the curtain to be dropped. They then mounted the stage and slashed the curtain to ribbons "in the presence of all Carson." The next day they voluntarily paid a thousand dollars into the town school fund, where it received the name of the "Carson Rowdy Fund." The affair, as it proved, was the result of a wager made in one of the Carson saloons.

Before closing this chapter a few statistics of the towns of Washoe at the end of 1860, when winter had already commenced, will give the reader an idea of what had been accomplished by the pioneers. In Virginia City the huts of early summer had mostly been replaced by board cabins, for lumber had fallen to \$80 per thousand as soon as a good road was built. Over a hundred buildings were in process of construction, besides an uncounted number of lesser shanties. The town contained 38 stores, 25 saloons, 10 livery stables, 2 quartz mills, 5 lumber yards, 9 restaurants, 8 hotels and boarding houses, and 8 law offices, besides bakeries, blacksmith shops, etc. The monthly rent of a cigar stand was \$125, and that of a wooden warehouse twenty feet square was \$250.

Prices of supplies were very variable during 1860. Flour, which was 20 cents a pound in January, was \$1 in April. The newspapers gave the following as customary rates until May or June: Brown sugar, 50 cents a pound; rice, 45 cents; butter, \$1; tin plates, \$9 a dozen; liquors, 50 cents a glass. Prices fell rapidly during the summer, but rose again with the first snow-storm. On October 27th flour was 14 cents per pound, barley was 12 cents, and hay was \$100 a ton.

Wages were correspondingly high. Masons received \$8 a day; carpenters, \$6; tinsmiths, \$5; common labourers, \$4; cooks, \$100 a month; waiters, \$60. Ordinary miners got \$5 and mill hands from \$4 to \$6 a day.

At the close of 1860 the population of Silver City near Devil's Gate was 594; of Gold Hill, 600; and of Virginia City, 2,244. The three small settlements in the valley—Dayton, Genoa, and Carson—had kept reasonable pace with the three towns of the Comstock. Other settlements were established in the Washoe Valley and the Truckee basin. The names of new camps began to be heard in every direction.

Everywhere, after the summer of 1860, the Californians controlled the politics and business of the region. In the constitutional convention of 1863 all except four out of the forty-three delegates had come to Nevada from California. In the convention of 1864, which drew up the constitution under which the State of Nevada entered the Union, all except four out of forty-six members were Californians. Long before this, however, the financial control of the Comstock had largely passed into the hands of San Francisco capitalists.

CHAPTER X.

FINDING, TESTING, AND WORKING ORES.

BEFORE the miner comes the prospector; the ore must be discovered before it can be tested, or the precious contents extracted. We have been so long following the fortunes of a single camp that we have in a measure neglected the hero of many an unsung epic of the American frontier. People often wonder why rich mines remain so long undiscovered, and why the early prospectors made so many mistakes, overlooked so many rich districts. On the contrary, a little reflection will convince any one that the exploration accomplished by the comparatively small class of pioneers who devote themselves to looking for mines is really very creditable.

Wherever the old quartz prospectors wandered with their blankets and burros they examined with critical gaze every boulder, and tried to trace every scattered fragment of "float rock" back to the ledge from which it came. They endured nameless hardships, fought Indians, starved and froze among the snow peaks, perished by thirst in the desert, or became old and worn out long before their time, despite their sober and outdoor lives. With pick and rifle they opened up nearly all the great mining districts of Nevada, Arizona, Colorado, Idaho, and Montana. The true story of their lives has never been written, and never can be written; it remains a sealed book, in a mysterious language of

which only occasional episodes may be haltingly translated. The story in its fulness is only known to those who have spent years as wandering prospectors, the Boones and Carsons of the mining class, and such men can not tell it themselves.

Each prospector develops in the course of time his own pet theory of the formation of rocks, and more particularly of the genesis of gold and silver. He knows certain rocks, usually by terms of his own, and all the rocks he doesn't know are grouped under the convenient classification of "porphyry." An observing writer, F. M. Endlick, in the *Overland Monthly*, fifteen years ago, narrated something of the experiences of Grizzly Joe and Dutch Billy. They had followed up a bit of float and at last found the ledge from which it came, high up on the mountain side. It seemed rich, and one of them guarded it while the other went to the nearest town, several days' journey, to obtain an assay—thirty-two ounces of gold and nine of silver to the ton.

They named it the "Little Annie," after a frail, fair-haired child of years before, away back in some Eastern town. After a few weeks, as they worked on the ledge, she (all ore veins are feminine in miner phraseology)—she "did not show up well." Pretty soon the two walls inclosing the vein of ore came closer and closer together; after a few more days there was no ore in the bottom of the sloping shaft—the vein had "pinched out"; "Little Annie was gone." The two prospectors contemplated the deceitful "gash vein" with a mingled expression of grief and astonishment. Then, striking camp, they pushed on toward another district. Winter was approaching and "grass was getting short" with them—that is, their funds were running low.

"Halloo, stranger!" said Grizzly Joe a few weeks later to a dilapidated-looking specimen whose back was turned to the district they were bound for and who was evidently trying to escape from it with all possible speed. "Halloo, I say; been up to the new mines?"

"You bet!" was the laconic but expressive answer, while the stranger glanced sorrowfully at the holes which constituted the greater portion of his boots, and at the cacti and obsidian splinters strewn over the desert trail.

"Let's have your candid opinion of the chances there."

"Chances? I never seen none. There may have been some, but they're mighty well corraled, and I don't think the whole district is worth a blank anyhow, Cap'n."

"You're kinder down on your luck; but never mind, stranger, you'll strike it yet if you stick to it. Guess we might as well be there as anywhere else."

The two prospectors resumed their journey with dogged resolution.

Fortune finally smiles upon their efforts. Beyond the new district, in a region hitherto but slightly explored by prospectors, they find a permanent lode, and appropriately name it "Last Chance." Buyers come in, for one or two noted mines are in the region, and pretty soon they sell out for a few thousand dollars, divide, and separate for the winter. "Dutch, old pard, next spring we'll take another trip!" is Joe's parting remark.

In the last decade, prospecting has more and more attracted adventurous men, and in some cases women. Several thousand persons are busy, even while these lines are being printed, looking for new mines in deserts

and mountains. In some districts prospecting can be done only in winter, in others only in summer, while a few favoured regions give explorers a chance through the entire year. Most of these men are "grub-stakers"; they get enough to live on—perhaps \$15 a month—from wealthier miners or from speculators. The courts have decided that a grub-staker is entitled to half of every mine he discovers, and this interest, now and then, gives a man a fortune. Very few mines are being found in these days by haphazard luck. The successful prospectors are patient, methodical, indefatigable workers, who often spend years in following up indications, exploring every ravine and peak in a promising district. Every year some grizzled old prospector turns up with valuable discoveries, after half a lifetime of arduous, exacting toil on the frontier, and the good news inspires all the other prospectors with renewed happiness.

The processes of testing gold ores are within the comprehension of the most ignorant, but the most highly trained intelligence is required in the more delicate and difficult tests of the silver assayer. Nearly every quartz miner and prospector in Comstock days carried a small magnifying glass with which to examine ores. If the rock looked well, a specimen was pounded to dust in a common mortar or on a flat stone. The prospector then took it in his horn spoon, a flat vessel made from half of an ox horn, and washed it with great care so as to save every colour of gold. It will be seen that all this resembles the simple pick-and-pan method of prospecting for placer gold. The quartz prospector prefers the horn, because he only pans out a few ounces of powdered rock, and the flakes are so much finer that a more manageable tool is required than in the case of the placer prospector. This process

is called "horning a prospect," or "assaying with a spoon."

In early days the only test that prospectors knew how to use for silver was with acids. They pulverized the specimens as if for a gold test and washed the lighter matter away, leaving all the metallic portion. This residuum was then put into a flask of annealed glass, covered with nitric acid, and heated over a flame. The contents of the flask were then treated with salt, or with muriatic acid, when chloride of silver was precipitated. Chloride of silver, once obtained, was easily reduced to the metallic form by drying it, placing it in a hollow cut in a piece of charcoal with a little soda, and blowing the flame of a candle against it, when it made a button of pure silver.

The old prospectors soon discovered that there were ores that were "obstinate" and refractory under the nitric-acid test. When the value of chlorides was discovered they dubbed every heavy metallic rock that they could not test for themselves a "true silver chloride." As the chloride ores have to be smelted in a crucible, the nearest assayer was called upon, and his returns were looked for with great anxiety. Usually the rock was not worth working, but sometimes it was a sudden bonanza, as was the case with the astonishingly rich chlorides of Colorado. In these days the best prospectors who do not wish to take any one else into their confidence have mastered the principles of using the crucible. Many a man who goes into the desert with his pack mule carries something of an assaying outfit, and can test almost any ore.

Since the Comstock mines contained gold, silver, copper, and other minerals, the management of their ores presented almost unsurmountable difficulties to the early miners as soon as they reached the ledge and were

compelled to abandon their rockers. They naturally turned for help to the few Mexicans in the region, for every Mexican was supposed to have an intuitive knowledge of silver-mining processes. As long as this confidence lasted it was a very good thing for the sheep herders that strayed over the Sierras from the San Joaquin, for every Comstocker wanted to hire them at once.

When the mines were somewhat opened—that is, quarried into by the use of shovels, picks, crowbars, drills, and blasting powder—there was quartz to be worked for its hidden metals. The *arrastra* was the first method adopted. An *arrastra* is one of the simplest methods of pulverizing and amalgamating auriferous quartz. It was invented, or re-invented, centuries ago by the Mexicans, and consists of a circular bed from eight to twenty feet across, paved with stones, in which quartz that has been broken into small pieces by a sledge hammer is placed and slowly ground to dust by the dragging of a large “muller” or slab of granite over the quartz-covered pavement. In the best form of the *arrastra* the paving is very carefully done with hewn rock, granite, or greenstone; a boundary wall of granite a foot or two in height confines the quartz, and a post rises in the centre from a stone or iron socket. Two arms project from the post, fastened in a framework so as to revolve easily, and one of them projects so far over the wall of the *arrastra* that a mule can be harnessed there. Suspended from the arms are two huge mullers, or sometimes four, in which case two mules are necessary. Each muller weighs five hundred or a thousand pounds, and is suspended so that the forward end is an inch above the pavement while the other end drags.

The rule for breaking the quartz is to make it like



Interior of a Mill.

good road metal—no piece larger than an inch across. About four hundred pounds is then put into an *arrastra* ten or twelve feet in diameter; a thousand pounds into the largest size. If the quartz is not very hard it can be pulverized in four or five hours. The ore is kept wet all the time, and the grinding is continued until the mass is like cream. Quicksilver is then put in at the rate of an ounce or more to each ounce of gold that is supposed to be in the quartz, and the grinding goes on for an hour or two longer until the amalgamation is considered complete. Quite a stream of water is then allowed to run in through a sluice gate, and the grinding continues half an hour, to let the amalgam settle in the bottom. Grinding then stops. Another gate is opened, and the stream of water soon washes out the fine gray mud to which the rock has been reduced, leaving the metal on the bed of the *arrastra*.

From *arrastras* to stamp mills is an easy step for Americans. Water claims and mill sites were taken up almost as soon as work had fairly begun on the Comstock, and machinery was ordered in California. The principle of the stamp mill is very simple. Heavy iron stems raised by iron cams and receiving a rotary motion as they rise are used to crush the quartz. The mill men of Nevada County, where quartz mining was first undertaken on an extensive scale, were in great demand on the Comstock. They knew all about the most perfect processes in use in that famous gold-bearing district, and when they went to Washoe they built mills on the same general plans, with such modifications as experience suggested, but none of them knew much about silver ores.

The first working of Comstock ore was done at San Francisco in the winter of 1859, when forty tons of selected rock from Ophir was handled at some profit,

though costing about twenty-four thousand dollars, including transportation and other charges. There could be but little thousand-dollar ore, even in Ophir, and so it was necessary to build mills in Washoe. A well-written paper by A. D. Hodges, Jr., of San Francisco, entitled *Amalgamation at the Comstock Lode, Nevada*, which was read before the American Institute of Mining Engineers in September, 1890, gives a trustworthy account of early milling operations. Many of the prominent mill men and inventors of the period were more or less controversial, and waged a dreary warfare against their rivals through numberless newspaper articles and pamphlets whose interest for modern readers has long evaporated.

Almarin B. Paul, a very able and intelligent mill man of Nevada City, began to study the silver sulphurets of the Comstock in the autumn of 1859. He treated them with the chemicals of the *patio* process, and, after many experiments, went to the mines, where he organized "Washoe Gold and Silver Mining Company No. 1." Selecting a site for his Pioneer Mill, in Gold Cañon, near Devil's Gate, he signed contracts on June 12, 1860, to work ore from Gold Hill on and after sixty days from that date. Few men would have taken such risks, for the machinery had to be made in San Francisco and transported across the Sierras, while the needed lumber was still growing in the forests. However, Paul worked as one inspired, and on August 11th, just in time to save his contracts, the steam whistle blew, and the twenty-four stamps of the Pioneer Mill began to rise and fall upon Gold Hill ore. Three hours later, and not far off, Paul's rivals, Coover and Harris, of Amador County, California, set in motion the machinery of their nine-stamp mill.

Without going into more technical details, I may

explain that Paul crushed the ore dry in his batteries, and then amalgamated it in small Knox pans, each of which held about three hundred pounds. Each charge was treated with forty pounds of quicksilver, a pint of salt, and a few ounces of copper sulphate. When Paul had fitted steam chambers to the pan bottoms his Washoe process of pan amalgamation was an acknowledged triumph, especially with Gold Hill ore, which was simpler than that of the North End mines. In a few months Paul's company began to build another and much larger mill of sixty-four stamps, introducing mechanical improvements. Other mills followed, constructed with more and more skill. The ultimate Comstock verdict was in favour of stamps of about nine hundred pounds, dropping about a hundred times a minute, and crushing wet. Since that time the amalgamating pans have been greatly improved.

When the first mills were completed, the only mines that were being worked in a manner that really indicated the permanent value of the district were the Ophir, the California, and the Mexican. As the ore was taken out of these and a few other Comstock mines it was assorted into grades. The best, which would yield one thousand dollars a ton and upward, was sacked for shipment to England, except the small amount required to keep the *arrastras* running. The second- and third-class ores were piled up for future milling. Rock that would not pay fifty dollars a ton was hardly considered worth saving.

Even after pan-amalgamation systems began to come into general use some of the early milling men, like some of the early miners, learned their business by slow degrees. They knew very little about silver ores, and so the day of the "patent-medicine-process fiend" dawned on the Comstock. Washoe was fairly

overrun by eager inventors with chemical compounds that they felt certain would capture every particle of gold, silver, lead, copper, and other metals and grade them into separate piles. Every ragged and penniless dead beat in Virginia City buttonholed mine owners and mill men with a story of some secret process "worth millions, sir!" Sulphate of copper, salt, and quick-silver, long used by silver miners and mentioned in every mining book, were not sufficient. Neglecting the good old axiom that thorough grinding and working of the ores is the primary principle of successful milling, everybody seemed to go rainbow chasing for something that would perform impossible chemical wonders. A number actually used immense quantities of a bitter sage-brush decoction, and were thoroughly persuaded of its efficiency until a few of the newspapers praised the famous "sage-brush process" to the skies. As late as 1862 there was a mill on the Comstock that advertised reduction of ores by the "sage-brush method." It was argued that Nature had created this most bitter and worthless *Artemisia* for the express purpose of getting the metal out of Nevada's silver mountains!

When such absurdities as this were believed by the masses it is no wonder that half-crazy schemers with a few ponderous phrases at their command could impose upon the community with secret processes for which they wished large sums of money or royalties. They hailed from every part of the world. The Englishman had "studied silver in Cornwall," the German at Freiberg, the Spaniard in Sonora or Peru, and each and all carried the whole trick in a little bottle in his vest pocket, ready, for a consideration, to pour a few drops into the amalgamation pan.

The mill men, as I have said, caught the popular

desire for some easy and "dead-sure" method, and long after the notion of cedar and sage-brush decoctions was definitely abandoned many of them were still ransacking the drug stores of California for new and unheard-of substances to mix with the pulverized rock in the batteries. Alum, saltpetre, borax, potash; all the acids obtainable, from muriatic to sulphuric; tobacco enough for an Australian "sheep-dip"; a multitude of strange drugs and vile concoctions never before known in the mining world, and seldom since—such were some of the contents of these witch caldrons.

Meanwhile the building of new mills went on with all haste possible, at great expense and in all sorts of places, whether or not there was ore enough in sight to keep them busy. No less than seventy-six mills, costing in the aggregate six million dollars and carrying 1,153 stamps, were built and running by the end of 1861, and twenty more were planned or being built. Several Mexican *patio* yards and fifty or more *arrastras* were in existence. All this was within fifteen miles of the Comstock. The mills lined Seven-Mile, Six-Mile, and Gold Cañons, from Virginia City to the Carson River; they were scattered along the Carson for ten miles or more, and several were even on Washoe Lake.

It would seem as if the main problems were now solved and the success of the districts assured. But, notwithstanding the plenitude of energy and capital poured out, the chief result for years was loss and bitter disappointment. So many mills were built that the ore in sight in the mines could not possibly supply half of them, and the price of reduction fell to twenty or thirty dollars a ton, which did not pay the majority of the mill owners with their crude processes and high prices of labour. The whole country was so overflowing with excitement that every prospector deemed himself a

millionaire, whose rich ledges had only to be poured into hoppers to run out bullion. Every one was willing to accept the wealth of the region on the strength of vest-pocket samples of ore. Forgotten mines, like the once-popular "Sucker," were expected, according to their assayers, to pay five hundred dollars to the ton—and yielded less than twenty dollars on a working test, so that none of the mills of the period could show the owners a profit. Numbers of the mines never yielded much besides assessments and litigation.

Kelly's First Directory of Nevada Territory, which I find was written for him by the versatile Dr. De Groot, and is now an extremely rare volume, contains descriptions of all the mills built in the various Nevada districts before the close of 1862. He lists some eighty-two effective mills. A low estimate would be that fifteen hundred tons of ore a day could be worked in all these mills—provided that it could be obtained; but the mines were not producing more than four hundred tons daily! The published statistics of the mills vary greatly. The Surveyor General's report for 1865 mentions only eighty. J. Ross Browne's report, three years later, gives 122 mills, with 1,462 stamps.

Some of the mills of the pioneer period (1860-1863) are still spoken of among miners as magnificent examples of wild extravagance. The great Ophir Mill property contained, besides the mill itself, large shops, stables, offices, and residences. Up to April, 1862, as estimated by Mr. Lord, \$349,200 was paid for the reduction of only three thousand tons of ore, for freight, and for office expenses. The works had cost \$200,000 additional. "Gould and Curry" built the greatest mill folly of the time on an artificial plateau cut out of a rocky point two miles east of Virginia City. It was a highly artistic structure of stone and wood, ap-

proached by steps of stone and broad terraces. A lake and fountain, and groups of costly residences, offices, and cottages won the visitor's admiration. Very nearly a million dollars was spent here in picturesque profusion by the prosperous mine owners, then in the full glory of a famous bonanza. But turning to results, we find that at the close of the year 1863 this prodigal mill had been able to reduce only 4,812 tons of ore, at a cost of about fifty dollars a ton. It was found necessary to throw out nearly all the machinery and reconstruct the mill in 1864 at a cost of nearly \$600,000.

As the reader may conclude from the preceding paragraphs, none of the pioneer mills—not even the costliest and largest—were such mills as a progressive miner of the present time would use if he could help himself, though they were the best that could be constructed upon lines of California experience. But millions of dollars were undoubtedly lost in the first few years, chiefly because the tailings, or pulverized rock that has passed through all the processes for gathering up the metal, were suffered to go into the streams, to be washed at last into the Carson sink, or alkaline lake. No one thought of putting in a flume and running the waste to some flat, to be kept until cheaper processes made it possible to work it at a profit.

Mexicans are accustomed to saving mine tailings, and if any Mexican was out of work he went down into Gold Cañon and "concentrated tailings" for a living, usually by the *patio* process. Two men who worked in the summer of 1860 in this way are said to have taken three thousand dollars apiece with them when they left the district. Although there was every sort of evidence that the streams were full of precious metals lost from the mills, it was years before the tailings

were properly impounded in reservoirs for future working.

The problem of handling tailings severely tried the best metallurgical skill of the times. The term "tailings" as here used includes all the ore residues, or waste, whether slimes, pan tailings, or concentrates. Louis Janin and his brother, leading metallurgists on the Comstock, began to experiment with tailings as early as 1862, perfected a process, and built separate mills, gradually creating an industry which employed many men and at times yielded large profits. The most successful tailings mill was Langtry's famous Lyon Mill, at Dayton, at the mouth of Gold Cañon.

One of the heaviest expenses of mill men is for mercury used in amalgamation. Quicksilver will divide into infinitesimal particles, and the smallest particle was found to contain gold and silver. How should it all be secured? Water that seems as pure as a mountain spring, because it has passed through flumes and settling pits after leaving the mill, is yet found to contain these particles. Even as the mint authorities find it necessary to save all the dust and soot, even on the roof, and occasionally melt out the gold, so the mill owners in every district find that the profit of the district depends upon a constant attention to details, and more particularly upon adopting every possible method of securing these elusive particles. As for the quicksilver which is so necessary to miners, the Comstock ores alone have sometimes required as much as eight hundred flasks, or 61,200 pounds a month. A whole colony of people in the California Coast Range, at New Almaden, were once producing quicksilver with all their might to send to Nevada. As the miners are fond of saying, "It takes one mine to run another."

The end of all such prospecting, costly testing, ex-

perimenting with ores, and building expensive mills in any new district, is that at last it is definitely determined whether or not the ores can be worked with profit. If not, the whole place goes to ruin. Mills, roads, shafts, tunnels, houses, hotels are deserted more rapidly than they were constructed, and everything is often abandoned as not worth hauling out. Avalanches sweep away the buildings or they fall into ruins. Grizzly and panther prowl around the deserted camp where thousands of men had staked their hopes and fortunes. There are many such deserted towns in the barren mountains whose very names are forgotten. The men that founded them are dead; the trails are obliterated. There is no pasture, or forest, or farm land to tempt any one to dwell there again. It is a more profound desolation than the desolation of Tadmor or Nineveh.

But if the ore is really rich, no matter how refractory, the story of a deserted mining camp is never sealed up and put away. As long as it remains an unsolved problem in metallurgy, it attracts tireless interest in the world of mining science until some new process—cyanide, or something else—is found to do the work. Till then, the best skill of the laboratories of America and Europe is focused upon the difficulty, and new hosts of miners are only waiting the word from some discoverer to pour again into the ruined camp and dispossess the panther and the grizzly. Sometimes they find a lonely miner there who has held his claim a quarter of a century or more, waiting for some one to unlock the treasure-house; sometimes they find only his bones, for Science, unheeding, eternal, takes no count of human years.

CHAPTER XI.

GREAT MECHANICAL PROBLEMS SOLVED.

Too much emphasis can hardly be put upon the purely business side of mining on a large scale, and the complete organization displayed therein. A favourite device of the cheap mining-camp novel, intent on thrilling situations, is to populate the abandoned drifts and worked-out ore chambers with rival secret societies of regulators and desperadoes. Here crime "holds high carnival" through plot and counter-plot and mystic midnight sessions (even in mines such meetings must take place at the time-honoured hour). All this goes on for weeks without causing the slightest suspicion on the part of the honest miners or mine owners that outsiders are occupying the place in a sort of Box-and-Cox manner. Such a scene in a novel or on the stage is apt to rouse the rude laughter of those who know mines and mine owners as they really are.

A quartz mine is always guarded with jealous care, especially if its shares are listed on the stock boards. No one goes down without a permit, and certain portions of the mine are never visited except by the owner, the superintendent, and a few reliable men. The actual condition of the mine is only known to a few persons. Many times the whole mine is shut down to outsiders, so that even personal friends, newspaper reporters, and men of science are kept from any knowl-

edge of what is going on within. As a consequence of such systematized watchfulness, few persons ever see the whole working of a mine, and a multitude of absurd popular myths have arisen. In fact, most people never see anything of a quartz mine in operation, for they are all difficult of access. Lastly, there is only a small proportion of those who do visit such a mine who ever obtain a true conception of the mechanical problems involved in the gigantic task of working it successfully.

Comstock miners say that it is evident that the preconceived ideas of most persons who visit Virginia City to see the mines are derived from quarries or coal mines, and neither are of much value in the case. A quarry of building stone, opened to the sky, certainly requires much and highly skilled labour to choose the valuable portions and reject the inferior, to clear away the refuse, and to cut and break out the required blocks. Expensive and powerful machinery is used. All the surroundings of the occupation are large and free, so that the quarryman is a sturdy figure among craftsmen, but quarrying can not even be called an apprenticeship to quartz mining. A collier encounters many of the difficulties of the miner for metals, but others are equally unknown to him, and he often quarries along in the coal vein as easily and steadily as if he were breaking out slabs of sandstone from a wind-swept hillside.

Mining is not well-digging or quarrying, even in the blanket deposits of Arizona, or the blanket veins of the Rand, though sometimes ore bodies are found that require little other labour. But every mine of the true fissure-vein type is an original and separate problem. Underlying the picturesque details are vast and ever-increasing difficulties, met or avoided by constantly

developing human skill, rising in time of need to positive genius, so that a great mining engineer ranks with the builders of pyramids and Brooklyn bridges.

As soon as the miner has succeeded in working his ore he knows, in terse camp language, that he "has a mine, and not a hole in the ground." Then he begins to "develop the mine"—that is, he endeavours to ascertain its value and put it into shape for profitable working by explorations, necessarily very expensive, and by planning his operations, both on the surface and underground. The miners burrow their way through the earth, searching for precious metals, toiling through barren acres for weeks and months, or following threads of ore, streaks of clay, and a thousand "indications" that are Greek to the uninitiated, but which may lead at last to a rich deposit. They are beset by perils of flood and fire, of explosion, of falling rocks, of the collapse of roof, sides, or floor of the narrow places in which they toil. And, in the mining phrase, "no man can see an inch ahead of the end of a drift"; no diamond drill can take away the uncertainty of the business. The miner, in point of fact, is turned loose in the heart of the rocks and left to creep around there like an ant in a mountain.

The Comstock, though called a lode, is really a broad metalliferous belt or ore channel. It contains many narrow lodes, disjointed strata, bunches and chimneys of ore, in distinct clefts, separated from each other by what the miners call "horses" or fragments of rock from either wall—fragments often a thousand feet long and several hundred feet thick; separated also by seams and patches of clay, gypsum, and carbonate of lime, by masses of quartz and dikes of porphyry. The minerals found in this great mass include native gold, native silver, stephanite, chloride

of silver, galena, antimony, and several rare forms of silver, besides zinc blende, iron pyrites and copper pyrites. The whole body, constituting what miners call a vein, or vein matter, is lodged in a system of fissures rather than in one great fissure, and is walled in on the west by granite-like diorite which composes the mass of Mount Davidson and of other peaks and ridges. On the east side the hanging wall is diabase, which resembles basalt. But these irregular boundaries which confine the vein matter are merely the shattered edges of the vast chasm rent apart, closed together, and again forced asunder during the ages of volcanic action. Under interior chemical and dynamic agencies reefs of quartz a hundred feet thick have been ground to dust, and the whole seething caldron of steam and fire, filled with minerals in solution, has slowly cooled and settled into its present condition.

The general direction of the vein is north and south, or rather it points a little east of the magnetic pole and conforms to some extent to the trend of the mountain. It is customary to include about twenty-two thousand linear feet in the vein, and its width varies from one hundred to twelve hundred feet. Some of the mines in this territory have paid largely, others have yielded little, and the fertile portions are comparatively limited. The vein was at first found to slope westward under Mount Davidson, but at a greater depth the slope is eastward under Virginia City, and the miners sank a second, and afterward a third, series of shafts east of the original line of shafts. In some cases they ultimately moved three thousand feet east for convenience in working the mines. The general slope of the lode toward the east as one descends is fifty degrees.

The larger mechanical problems connected with any mine relate to reaching and removing its various ore bodies; to preventing caves, fire, and other accidents; to efficient lighting, drainage, and ventilation; to obtaining in abundance the two essentials of mines, mills, and camps—wood and water; and, in conclusion, to the creation, maintenance, and constant enlargement of the whole mining enterprise and of its innumerable dependent industries, until, after the lapse of years, the mine or group of mines is worked out. One can easily see that all this implies the constant existence of a vast reserve force at or near every mining centre. There must be forges, foundries, machine shops, sawmills, upon a large scale; the finest specialized talent must be within reach; inventors and men of original power are in demand, for not only fame and fortune, but life and death hang on the issues that an hour may bring forth. That which is needed in a great mine can and must be had. "Impossible" was never written in the miners' dictionary.

The first serious mechanical difficulty that the early Comstockers had to surmount was forced upon them within a year or two, and the result was of profound interest to miners everywhere. Old Ophir, which had "paid from grass roots down," soon discarded the hand windlass and buckets with which it had started and put in a horse power, or "whim." After a few months a fifteen-horse-power steam engine was obtained to pump out the water through a four-inch pipe, to hoist ore, and carry men up and down. This engine was the "finest thing of its kind on the Comstock" when it began operations.

Meanwhile, as Ophir's incline slowly descended, the rich vein grew wider and softer, until at the depth of one hundred and seventy-five feet it was forty or fifty

feet across and of so crumbling a nature that pillars could not be left in sufficient numbers to support the roof. The ore body, a true bonanza, continued to widen as it descended, and soon the miners found it impossible to take out any more rock without extreme danger. Work was finally stopped in the mine, for the whole mass of vein matter and overhanging rock was slowly descending upon them. If the contents had been diamonds instead of thousand-dollar tons of ore, the miners could not have taken out any more without inventing some new system of operation. The engineers were stumped also; there was no record of such a width of ore in any of the mining authorities.

Of course there had been timbering done from the first. Posts and lintels had been used in shafts and drifts. In this system, the only one then known, round logs were set up at the sides, and another log was placed across them at the top as a cap. These frames were put as close together as possible, making a continuous sheathing of pine logs a foot or even two feet thick from the surface of the ground to the bottom of the incline and along every portion of the various drifts. In some cases the logs were rudely squared and then clamped and bolted together so that it would seem as if they would withstand any pressure. In ordinary mining much lighter timbering than this often proves sufficient, but in the Comstock the great width and the varying density of the vein matter made the slacking and swelling of the ground something unparalleled in mining history, and twisted the timbers awry in many instances. Besides, the miners could not work above or beneath such timbers without danger of deadly caves. Several, in fact, occurred, and a number of lives were lost.

In this emergency a German miner in California,

named Philipp Deidesheimer, who had been on the Pacific coast since 1851, came to the rescue. One of the San Francisco directors of Ophir, sending for him, asked, "What would you do if you had a quartz lode fifty or sixty feet wide?"

Deidesheimer replied that he had never heard of such a thing, but he had no doubt it could be handled. He would like to study the place.

"Go to Virginia City to-morrow at our expense," said the director.

Deidesheimer went down the Ophir shaft, and within a month, most of which time he spent underground in various tests and experiments, he began to open up what Ophir miners called the "third gallery," a chamber cut in the vein two hundred and fifteen feet below the surface. It was noised about that Ophir was about to try a new system of timbering, and, as the old method had been proved inadequate in other mines, the men stopped work and came up to see the carpenters framing above ground the "square sets" that Mr. Deidesheimer ordered. They looked very insignificant, and some were disposed to laugh at the performance.

"Square sets" consist of short, square timbers, four to six feet long, mortised and tenoned at the ends so that they can be put together in a series of interlocked cribs and built up in a continuous row or block to any desired height or width, filling the whole chamber as fast as the ore is removed. By using diagonal braces they can be indefinitely strengthened, or made to fill a chamber of any shape. They can be framed together solidly, as is often done, so that the ore is replaced by a mass of lumber, or waste rock can be used so as to make solid pillars from floor to roof, or even to fill the entire space. By February the Ophir mines were

successfully "stoping out ore" from wall to wall across a deposit which was sixty feet in width and yet was so soft that no blasting was required. By the time the sixth gallery was reached a space two hundred feet in length, sixty-five feet wide, and five hundred and sixty feet in depth had been emptied of ore and was kept from falling by means of the square-sets system of support. Beyond a doubt "square sets" could often be used to support the roofs of coal-mines, where so many caves occur when the whole vein is removed.

German, English, and French engineers came from Europe to examine and report upon the new Comstock system of working ore bodies. They declared that it "could no more be improved upon than the cells of a honeybee." In soft rock and hard rock, at any angle or across any distance, the square sets became indispensable to all miners working large ore bodies. The idea was never patented, and so it became the common property of mining men the world over. It was the first of the famous Comstock methods that gave the lode a reputation.

But although every one recognised the importance of Mr. Deidesheimer's invention, which at a single stroke had solved the first practical difficulty that confronted the early miners, his system was often carelessly and grudgingly used. Cave after cave occurred, filling up the excavations, crushing men and timbers together, and rending the surface of the earth into chasms. None of these caves occurred in Ophir, of which Deidesheimer was now superintendent.

The dangers that were obviated by the proper use of the square-set timbers are well exhibited in these early caves. Few occurred in 1861, but in the spring of 1862, when the snows melted and the surface waters of the Comstock increased in volume, clumsy super-

intendents suffered, for a number of mines were closed by falling *débris*, clay, and rock. A few mine owners heeded the warning and put in better timbering when the drifts were cleared. Mexican—which, as previously noted, was very old-fashioned in its methods—became in the summer of 1863, as the Territorial Enterprise said, “a lovely chaos.” One half the surface of the mine fell with a frightful clamour which roused Virginia City, and an acre of the surface was opened to the depth of nearly two hundred and fifty feet, as if dynamite had been exploded underneath. There had been incessant and unmistakable warnings for weeks and months; the workmen had reported props twisted and bent, cap timbers broken, and dull noises of yielding earth and quartz. The superintendent and twenty miners were below, but, fortunately, were near the bottom of the incline, and so escaped, while the enormous mass, already beginning to fall, had half closed the passages.

While the miners were learning how to protect their shafts, drifts, tunnels, chambers, and various underground workings, the enemy of all miners—water—was becoming the chief obstacle. Noachian deluges of water, seeping continually out of every part of the porous vein matter which received the drainage of the mountains, threatened to compel the abandonment of the Comstock, as a similar reason had caused the ruin of some of the most productive mining districts of Spain, Mexico, and Peru. Durango’s famous Real del Monté mine was flooded for fifty years. The other day, in California, a mine was pumped out which had lain useless since 1860, and it is now yielding at the rate of \$50,000 a year.

By 1861 Ophir had a pumping engine of forty-five horse power to raise the water to a point where it could

be discharged through a tunnel, and ten or twelve other pumping engines were on the lode then or soon after. The miners had learned to avoid as far as possible the wetter points of the lode and the water reservoirs in clay, but this system of creeping past the worst places could only be a temporary expedient. Sometimes the careless stroke of a pick cut into a "water pocket" and forced the men to run from the drift, pursued by a torrent. Large areas of profitable mining ground were neglected through fear of the water, and sometimes drifts had to be closed by walls of masonry. Fortunately, at this stage of affairs the water was comparatively cold, not boiling, as afterward on the lower levels.

Larger pumps were placed on the leading mines. Best and Belcher, in 1864, bought a pump of twelve inches bore, and were then able to reopen some of their underground works. Crown Point, Overman, Ophir, Justice, Uncle Sam, and Yellow Jacket won undesired pre-eminence as "wet mines." Ophir struck a water pocket in 1864 that rose one hundred and sixty feet in the shafts and long defied the pumps. Belcher, when lifting 1,017,878 gallons every twenty-four hours, found the pumps too weak to extend work below the 420-foot level. Engines of five hundred horse power were put into operation, and the finest inventive skill of the Pacific coast was called into service.

There came a time when eight or ten million gallons must be lifted daily from the Comstock. More powerful pumping machinery than ever before used in the history of mining was constructed to drain the lode. The iron works of San Francisco became known for the excellence and originality of their mining machinery. Comstock pumps, by a number of successive adaptations and small inventions rather than by any

single epoch-marking discovery, reached the highest degree of efficiency known to engineers.

Pioneer Virginia City had numbers of wells and a little water from springs. Some of the wells were soon drained dry by the mining shafts and tunnels. In the local phrase, the "bottom fell out," and the term was soon applied to any sudden collapse in the stock market. There were instances on record of men who were drawing water in their back yards being surprised at seeing the water suddenly disappear in a chasm or crevice, some drift or "upraise" in the vast underground world of the Comstockers having tapped the reservoir. The springs in the district, small and few in number, suffered in much the same way.

Even the surface water of Gold Hill and Virginia City was abominable, even to those used to the bitter water of the desert. It "alkalied people" in the concise southwest phrase—that is, it often made them weak, and acted something like a dose of physic. One or two surface springs fed by snows were better, but these were very small; and as for the water from wells, nothing could easily be worse except the water from the lower levels of the mines. Ross Browne, in his *Peep at Washoe*, remarked that the water was certainly the worst ever used by man. The miners, humbly desirous of improving the quality of their drinks, used to mix "a spoonful of water with half a tumblerful of whisky."

Evidently the highly mineralized vein matter of the great fissures, such as the Comstock and others, was more or less a part of every cup of water. The dream of the alchemists of silver and of gold in potable form was realized, and still the Comstockers were not happy. Antimony, copperas, arsenic, and a few other substances quite as injurious to health were present

in the water. Nevada papers printed innumerable items, grave and gay, on the subject of Virginia City water. They assured the ladies that nothing else was half so good for the complexion as arsenic water; they congratulated the men on their improved lungs and capacity to climb to the top of Mount Davidson (like so many young Malcolm Græmes breasting Ben Lomond).

Then followed, to make a long story short, a search for water of good quality and abundant in quantity. It must be had at any cost. When there were only two or three thousand people in Virginia City and along the divide, men were tapping the adjacent peaks with short tunnels, trying to find water. When the population increased tenfold and twentyfold the problem was even more pressing. A "water-claim" excitement had set in, until hundreds of men were prospecting in the hills to find and reservoir water. They searched the flat-topped hills and heads of ravines; they tried to save water from the melting snows and keep it pure and cool for summer use. Miles upon miles of tunnels were blasted out of the granite and other hard rocks and walled up at their entrances. Old shafts, long abandoned, were also utilized as reservoirs. The barren, treeless hills north and south along the ridge of the Washoe Mountains were bored into in this manner, and the water from a thousand such sources was carried in pipes or small wooden flumes to Gold Hill and Virginia City. Nevertheless, the supply fell short every summer, and the natural reservoirs of water in the hills appeared to lessen very noticeably until the situation became even more serious.

While mills, mines, and growing towns were suffering for a pure and sufficient water supply, the Sierras were overflowing with pure mountain water, and

thither the energies and capital of the Comstock were to be directed. For a time the project, though often urged, lay dormant. At length, after a season of extraordinary drought, the miners, accustomed by this time to daring enterprises, formed a company and began surveys to the Lake Tahoe region.

The complete story extends over a long period, but it properly belongs here, as the culminating achievement in the line of mechanical problems. Distance, though about twenty-five miles over a rough country, was the least of the different elements to be considered by the engineers. They found that it was practicable to carry the water from a large mountain stream, Hobart Creek, by a fourteen-mile flume along a spur of the Sierras, to a point nearly two thousand feet above the floor of Washoe Valley. But Washoe, Carson, and other valleys formed a complete chain of depressions about the Virginia City region, and isolated the Washoe and Flowery ranges. They wanted to carry the water across this trough-like valley and deliver it at a point 1,720 feet higher, on the Virginia Ridge, so as to supply the towns and furnish hydraulic power. Clearly it was not practicable to pump nearly eighteen hundred feet, as the cost of the machinery and expenses of operation would be prohibitory. Mr. Henry Schüssler therefore advised the construction of an inverted siphon which could stand a pressure of eight hundred pounds to the square inch, the equivalent of a perpendicular pressure of a column of 1,720 feet of water. Pipe sections twelve inches in interior diameter had to be united hermetically. The length required to cross the valley was 38,300 feet.

It took a year to make the pipe. Each section fitted a particular place. Every curve and angle of the route was mapped out and measured accurately, and the

wrought iron used corresponded perfectly with the diagram before it left the workshops. The pipe undulates into and out of thirteen steep gulches, and makes many lateral curves. It is laid deep underground, and at each point of depression there is a "blow-off" cock, to drive out any sediment. On the top of each ridge is an air cock. There are 1,150,000 pounds of rolled iron in the seven miles required for the siphon, and it is held together by about a million rivets and fifty-two thousand pounds of melted lead. Over each joint is an iron band set with molten lead, and 442,500 additional pounds of iron were used in this way.

At last, in 1873, water leaped out of the pipe into the channel of Bullion Ravine and flowed into a flume that carried it into Virginia City. "The crowd were as wild with joy as were the Israelites when Moses smote the rock," said the Territorial Enterprise. All day long the people of the towns drank the sweet water and watched its musical flowing. Two million dollars had been well spent to supply the Comstock with water from the Sierras. The total amount furnished was about two million gallons daily, but it was insufficient, and after the great fire of 1875 a second siphon line was laid. A third line was afterward constructed and ample reservoirs provided. The theoretical capacity of all three pipes is about ten million gallons daily, curiously corresponding to the amount of water lifted at times from the lode, but six million gallons was about the highest daily consumption. The mines used the larger part of the supply.

Previous to the successful laying of the first Washoe Valley siphon the greatest pressure under which water had ever been carried, so far as known, was at Cherokee Flat, California, where the supply of a large hydraulic

mine was taken across a cañon nine hundred and ten feet deep by an inverted siphon. The fame of the Virginia City exploit went abroad and attracted more engineers to study the water system than even the mine timbering or the great Comstock pumps.

Thus, while the miners were laboriously running drainage tunnels and pumping out floods of worthless water, they were also siphoning their drinking water from the Sierras, and in such a manner that several hundred feet of fall was obtained for the development of hydraulic power, all of which was soon utilized to run pumps, to furnish electric lights, and for a vast number of milling and mining purposes.

CHAPTER XII.

DEPENDENT INDUSTRIES.

It is difficult to classify all the different types of men who help to make a mining camp. Certainly the prospector, the miner, and the mill builder form the central group, but hardly less important and equally interesting are the freighter, the lumberman, the builder of roads, the stage driver, and others who deserve more than passing notice. One can hardly say which of these comes first in point of time. The mines needed lumber and firewood from the day of their discovery. Building of roads began at the same time, and freighting and stage driving were easy to men who had taken trains of donkeys and pack mules across the Sierras when the rush to Washoe began.

All the summer and autumn of 1859 new trails were being hewn out on the sides of the Sierras and the old ones were being broadened so that a wagon could cross. The famous old emigrant road through Johnson's Pass from the head of Carson Valley to Placerville (in old days known as Hangtown) had once been worn down to something like a practicable grade, but travel along it diminished so rapidly after 1855 that much of it had fallen into very bad condition. The second great route, already marked out by a road that could be used in summer, was by way of Nevada City and Henness Pass.

During 1860 the usual method of the miners who

wished to open a new district rapidly—the building of toll roads—was adopted. In fact there had been a little toll-road work in Western Utah before 1859, and the greater number of the fine mountain roads of California in the '50's and '60's were built and kept up by private enterprise. Some of them were more profitable than most of the mines. The Territory of Nevada had hardly been organized before a fierce contest between those who desired toll-road franchises occupied the first session of the Legislature. Dan De Quille said that if all these franchises had been granted and the roads built, they would have not only filled the Territory, but would have hung far out into the desert like a fringe.

Neither California nor Nevada has since had mountain roads under the ordinary laws of public construction and maintenance, by local districts or counties, that begin to equal the firm, broad turnpikes of the old toll-road days. This is true even in those districts where the population has remained fully equal to that of thirty years ago. The noble art of making highways worthy of the alpine passes was lost when the teamster and the freighter disappeared.

The main Placerville toll road in the days of its completeness—from 1862 till 1868—was graded with consummate skill from the edge of the Sacramento Valley across the Sierras, across the Carson, and up Gold Cañon to Virginia City. At all the turning points were wide platforms walled with stones, firmly buttressed against storm and avalanche—platforms so broad that a ten-mule team could easily turn upon them. Trains of twelve or even eighteen animals harnessed to three wagons joined in line together could pass at any point on the roadway. Half a million dollars was the original cost of this macadamized road a hun-

dred and one miles long from Placerville to Virginia City. The yearly expense of maintenance was two, three, or sometimes five thousand dollars a mile, according to the season. Stations were built at regular distances, and in winter the road was kept as clear from snow-drifts as it was kept free from dust in summer. Swan & Co., who owned some twenty miles of the distance, received fifty thousand dollars annually over and above the cost of maintenance. The total cost of tolls between Sacramento City and Virginia City in 1863 was about fifteen dollars for a four-horse team; each additional animal cost a dollar and a half.

Between 1860 and 1862 four-mule teams were commonly seen, but after 1862 the number increased, for the roads improved and the teamsters knew their business better. One saw sixteen mules harnessed to a high Washoe wagon or to a train of three or four wagons coupled together. Similar outfits often extended for miles in such close lines across the highway that it was like a double procession. If a wagon broke down, the moving line swung around it if possible and went on unless help was needed. If an unlucky teamster fell out of line he sometimes had to wait for hours before he could fall in again.

Four hundred teams were being used in 1860; six hundred were engaged in 1861; by the summer of 1862 the San Francisco Bulletin said that there were nine hundred and fifty teams in the business, and the freighters were paid not less than three million dollars, including tolls. In 1863 came a great increase. According to an editorial in the Sacramento Union, 2,772 teams, consisting of 14,652 animals, were employed, and nearly twenty million pounds of freight passed through Strawberry Valley in eight weeks, which represents one third of the season's work. Another esti-

mate was that eighty-eight million pounds of freight went over Johnson's Pass every year, at an average cost of six cents a pound, or \$5,280,000. A more complete estimate was made by the builders of the Central Pacific Railroad. Anxious to determine how much business they could reasonably expect when their lines crossed the Sierras, they sent out agents who, after investigation, thought that one hundred million pounds really went by the Placerville route and half as much by the other routes. Fifteen thousand draught animals and three thousand men were employed in this great industry. Nearly a hundred stations, at each one of which there were stables, hotels, saloons, and stores, were built on the Placerville route. The road was a continuous double line of close-packed travel all summer, and life on the famous highway was infinitely more picturesque than on any railroad.

These trains of mountain wagons—slow-moving, vast—contained dry goods, provisions, tools, machinery, and merchandise of all descriptions produced in every part of the world, shipped to San Francisco across the Isthmus or around Cape Horn, reshipped to Sacramento, and there loaded into the waiting caravans. It is easy to see that this swiftly developing traffic made towns and cities spring up in a single season along its track. But there was more to the business than this single river of commerce flowing through the Golden Gate to Nevada. It was a river that received countless tributaries. It was fed ceaselessly by almost every man, woman, and child in ten thousand square miles of mountains. The mines made a better market than the valleys for hay and grain, for fruit and wine, for hogs and cattle, for eggs and poultry. Neglected pioneer orchards and vineyards were pruned and cultivated, so that the grapes, apples, peaches, and other

products of old-time California horticulture might be sent to the new camps of Nevada, where they brought almost the old prices of '49.

The appearance of Washoe wagon trains was always extremely striking and attractive. The wagons were peculiarly effective for the work required. They were not prairie schooners, or ships of the desert, or square-built ore wagons, but better, stronger, higher than any of these, and supplied with brake blocks that could be gripped by a lever upon a yard or more of the periphery of each hind wheel. They marked in every detail the utmost skill of the Pacific-coast workers in wood and iron, and were in their way as distinct creations of adaptive and evolutionary genius as the mountain stagecoach of the period or the Mississippi River steamboat in days before railroads. Of course many different types of wagons were pressed into service, the demand being so great, and one could see the famous Conemaughs, Missouri sail-tops, lumbering ranch wagons, and other types of Eastern manufacture. But the wrought iron of the California blacksmith, the imported ash and hickory shaped by the California carpenter under the direction of the leading spirits of the freighting business, made the most popular combination, though it cost two and three times as much as the imported article.

Horses could not stand the work, oxen were too slow; but large, well-bred mules, which cost from two hundred to four hundred dollars apiece, were the favourite draught animals. Oregon furnished many, and stock farms in the California valleys, chiefly owned by Southerners who selected their stock with great care, sold thousands of mules to the Sierra teamsters. Fine, strong animals, kept constantly groomed and in the best possible condition, were in these mountain mule

teams. The long trains came gaily into Virginia City after crossing the Sierras and climbing up from Carson Valley. Each animal had a row of small bright bells hanging from an iron arch over his neck. Great squares of combed and glossy bearskin—black, brown, or grizzly—covered the collars. All the metal of the harness glistened in the sunlight, while the leather was clean, flexible, and black.

Bearded, weather-beaten men walked beside the wagons or rode one of the mules, or sat at times on high, perched dizzily on the wagon seat above the tarpaulins which were always strapped carefully over the goods to prevent their being injured by dust or by sudden Sierra storms. Mark them well! No better race of sturdy, faithful mountain men were ever bred in fruitful America. Not merchants these, or prospectors, or speculators, but a brave, honest outdoor race whose huge Washoe wagons were the forerunners of the railroads. It was their business to furnish supplies to the miners and to all who lived by the work of the mines, but many of them went through all those pioneer years without ever entering a mine or owning a dollar's worth of stock in any one of the thousands of mining claims they passed and repassed.

Where this army of freighters came from no one could tell any more than one could classify the prospectors. A large number, however, had been the owners of mountain ranches before the rush to Washoe began, and had taken their own teams for the new work offered. Then, as their capital increased, they bought better wagons, better teams, and so still remained their own masters, occasionally hiring assistance or having outfits to rent, but always taking the brunt of the work on their own shoulders. Some of them were from the desert, where they had freighted goods for years to

the isolated settlements; some were from the high passes of the Rockies and had heard the whistle of Indian arrows in fortress-like camps with fellow-teamsters, wagon locked with wagon, a ring of wheels set with rifle barrels. A few gray and taciturn old freighters had once belonged to that fighting advance guard of the Americans, the famous teamsters of the New Orleans and St. Louis caravans on the old Santa Fé trail.

These freighters were noted for their honesty, sobriety, and business-like attention to every detail. Each one of them had thousands of dollars' worth of goods intrusted to his care without security other than his simple receipt. He carried these goods to the mines and delivered them to the consignees, taking their receipts. If there was ore to be freighted back across the mountains, he loaded up at the mouth of the mine, gave the mine owner his receipt, and took one in turn from the Sacramento banker or the speculator in ores.

The freighter's characteristic rod of empire was his whip—a long, close-plaited lash as big as one's wrist at the swelling part, and attached to a short hickory handle. When he held the staff upright and slowly waved it from the roadside the intelligent leaders would obey every motion, turn a loaded wagon or halt at the command, for they knew by sad experience the capacity for inflicting punishment that lay hidden in that serpentine coil, terrible as a South African jambok of green hippopotamus hide. The freighter's besetting sin, like the soldier's, was the uttering of "strange oaths," though it is said that in this respect he yielded the palm of fierce originality to the "bull-puncher," the man of ox teams in the logging camps.

Organization soon began to manifest itself among

the freighters. They had an association to fix rates before the close of 1860, when twenty-five cents a pound was the usual sum charged between Sacramento and Virginia City. Rates necessarily came down, as outsiders entered the business with all sorts of conveyances, so that for a short time in 1862 goods were hauled for two cents a pound. But the freighters, nearly all of them owning their own teams, soon formed a Union that remained impregnable until the railroad was built. The equipments of the members of the association were so complete that they could do better work than any ordinary teamsters. At first they were able to haul a thousand pounds of freight for every animal used, but eventually they became able to move three times as much—sixteen-mule teams actually drew twenty-four tons besides the wagons.

In the course of time, as mining camps were founded here, there, and everywhere beyond Virginia City north, south, and east, the sphere of the freighter was extended, and retiring slowly from the Sierras as the railroad advanced, he became one of the most distinctive and universal characters of the Nevada mining districts. Dr. Gally has forever fixed the type in his *Big Jack Small*, a famous story of the desert, whose hero is a plain old ore freighter of the Elko silver district. Considered as pure literature, the story is not inferior to Bret Harte's earlier tales of the California placer camps; regarded simply as crystallized fact, it would be difficult to find its equal in the whole range of Western writings. The school of the independent freighter—the Jack Small kind of a man—trained some of the most able business men, politicians and owners of stock farms, on the Pacific coast. Lastly, it is to be noted, in bidding the freighter farewell, that stage robbers and highwaymen stood in deadly

fear of his six-shooter and rifle. So far as I can ascertain, no case of loss of goods in transit, either by fraud, force, or carelessness, during all the years of the freighters' glory is on record in courts or newspapers.

Besides the freighter, the great mountain highways fairly swarmed with travel of other sort: men on horseback or in buggies and other conveyances; farmers with country produce; the blanket-brigade prospectors with pack donkeys; drovers with sheep, hogs, and cattle. All were interesting, but the stages, owned by different companies and making a business of taking people to and from Washoe, were the most striking features of the procession.

One stage company, the Pioneer Line, owned twelve fine coaches in 1863, and carried nearly twelve thousand passengers from California to Nevada and eight thousand back to California. The fare was twenty-seven dollars from Sacramento to Virginia City by the Placerville route. The annual receipts were about five hundred and forty thousand dollars, besides a liberal United States allowance for carrying mails. Six or seven hundred horses were in the stables, and scores of men were employed in caring for them. The stage drivers were aristocrats of the road, receiving from two hundred to two hundred and fifty dollars a month besides unlimited adulation.

Two other companies, the California and the Nevada, used the Henness Pass route, and carried between them about as many passengers as the Pioneer Line. Now and then competing lines were put on, but as the first companies in the field had taken possession of most of the possible locations for stage stations, they held a practical monopoly of the business. In 1863 the three companies received about \$1,200,000, and the annual amount probably increased consider-

ably above this figure before the staging era came to an end.

The stage ride across the Sierras became known abroad as one of the New World's unique pleasures. Tourists admired it greatly and called it the glory of the journey across the continent. First the rich Sacramento Valley in the heat of summer, golden with harvests for miles under the park-like forests of giant oaks, and beside the rivers lined with maples, cottonwoods, sycamores, and festooned with wild grapes; next the foothills, low-mounded, clothed with late flowers, shrubs, and scattered trees, full of springs and bright with fruitful orchards and gay gardens; then the forest belt, the noble coniferous forests of the Sierras, the pines and cedars, the scattered groups of Sequoias, the mountain laurel, ceanothus, azalea, dogwood, and wonderful natural growths of the Great Range. Everywhere new landscapes met the gaze; at each new turn the traveller saw lakes, waterfalls flinging their spray upon the road, ice-cold springs bursting forth and slipping down the hillside through wildernesses of tangled bloom. He looked down dizzy precipices upon the tops of giant pines; he looked up to arching forests overhead, and far above them the barren granite crags, snow-crowned, gleaming against the sky of heaven's clearest, most cloudless blue. From the summit of the Pass they saw the hyacinthine waters of sealike Tahoe, and farther east, beyond sharp descents and treeless hills, the level desert stretched out of sight, seemingly as vast and as trackless as ocean itself.

Such were the general features, with infinite variations in detail, so that even old stage drivers were heard to say that they enjoyed the outlook more every time they crossed the summit. Springtime in the valley meant alpine winter on the heights. Summer in the

farm lands meant the flush of spring in the passes, where brilliant blue and golden flowers and new grass were just looking forth at the edge of the snowdrifts. As for the desert, it was like the mountains and the ocean, a thing of infinite moods. Into that corrugated basin the short, swift streams of the eastern slope of the Sierras descend to disappear; the "eastward-gazing grizzly bear," to quote from one of Dr. Gally's stories, "lifts his flexible nostrils to snuff the odours of the arid waste, then slowly turns and prowls westward." Beyond is the "great empire of Artemisia," where gold and silver "were married in the volcanic chamber of the awful past." You see the nature of it from the mountain top—this land of Washoe with its browns and grays, its arid junipers and dull nut-pines on the rocks, its dark mountains of limestone, basalt, porphyry, granite, in naked barrenness. "Underfoot," writes Dr. Gally, "the world is dark, gray, and silent. Overhead, during the long cloudless day, it is pale-blue, dry, silent. All abroad, it is gray or dark with mountain distance, and it is silent." Silence is everywhere. No "roar of far-off torrents tumbling down the hills to jar the night air underneath the stars—the stars still are, but all the torrents have departed." Time was, at some lost period backward of all dates, "when the Great High Sheriff of the Universe in open court has cried 'Silence!' and has been obeyed."

All day long, from dusk of dawn to twilight, the swift, hard struggle to get mails and passengers across the Sierras continued. At times relays of coaches were kept up all night, with profit to the companies. Never before in the history of transportation was the tireless energy of men and animals and the value of thorough organization and lavish expenditure better exemplified than during the best days of the old Pioneer stage line.

The schedule time by stage from Sacramento to Virginia City—one hundred and sixty-two miles—was three days in 1860, and it was often hard to make connections; by 1863 the schedule time had been reduced to eighteen hours, and passengers could go on without stopping except for meals, or they could stay over one night on the road. Three wealthy mining operators who wished to reach San Francisco as soon as possible were once taken by the Pioneer stage line from Virginia City to the wharf at Sacramento in twelve hours and twenty-three minutes. The steamer was ready to cast off, and in less than two minutes they were on their way down the river.

Accidents occurred, as might have been expected, when several thousand men and twenty thousand horses and mules were daily strung out somewhere along the rocky highways. The freight lines opened to let the stages through, but droves of wild Mexican cattle were not so accommodating, and sometimes overturned the coaches. Masses of earth and stone slid into the road; horses stumbled and fell, dragging others with them. On one occasion a large grizzly bear ran across the road, frightening a stage team; the horses reared, ran partly around the coach, and broke the pole; the passengers “leaped off and out in every direction.” A stage on Johnson’s Pass once toppled over a bank and caught in the top of a tough-limbed Sierra pine; the passengers crawled out unhurt and reached the ground by dropping from limb to limb. It was a thousand feet to the bottom of the cañon where they would have landed if the pine tree had happened to grow somewhere else.

The pioneer stage driver of the Nevada-California lines was as different from the freighter as two classes of men could possibly be. One finds him occasionally in these days on the short stage lines left in the moun-

tains, but "Ichabod" is written upon the occupation, and the whole attitude of the drivers toward life shows it. Once they took all the celebrities of the Pacific coast over the Sierras, and had the delightful knowledge that governors, generals, mine presidents, and millionaires were laying plans to cut out each other and to possess in sole ownership the "seat by the driver," the best seat on the coach. Once they were distinctly at the top of mountain society, the unchallenged lions of the wayside inns, privileged characters, story-tellers at whose slightest word the loud laugh went around. Now they drive "mud-wagons" for the most part, that two or four horses can manage. Wages have fallen to two dollars a day; horses, harness, and everything else have deteriorated in like proportion, and the fragments of the old highways are hardly as good as the emigrants of 1849 left them.

These Jehus of the '60's are better than old files of newspapers. They can give you, if they choose, the very tones in which the judge summed up his charge to some sage-brush jury, the speeches of the lawyers when Ophir was fighting Burning Moscow, the talk of once-famous operators rushing across the Sierras with relays of horses. The glow and passion of the days they love to remember lingers still in their voices; they have stories of hunters told first in camps whose very names are forgotten, stories of outlaws in the Sierras, stories quaint, humorous, pathetic, gathered from thousands of brilliant and original characters who have travelled with them.

But there is still another class of outside industries created by the Comstock. Supplies and passenger travel were not more important to the mining camps than wood for fuel, for building, and for the timbering of the shafts, drifts, and other underground workings.

Wood choppers and lumbermen have always been prominent auxiliaries of every mine. By the winter of 1866 the price of firewood rose to fifty dollars a cord, and as retailed by the Chinese with burro trains to sixty and seventy dollars. The towns and mills along the great lode used by this time two hundred thousand cords of wood annually. Since the mills managed to get their wood for ten dollars, and since all provident persons laid in their whole supply in summer, it is not likely that more than \$2,500,000 was actually spent. Still, that was a very large sum to pay out for the fuel supply of so few people.

Of equally vital importance was the supply of clear lumber of the best quality. This could not be furnished by the brittle, knotty nut-pine of Nevada. A few forests were within the reach of the pioneer sawmills of Washoe and the upper Carson, but the prices were practically prohibitory of improvements. Then came an increasing demand from the lower levels of the mines, "Give us more lumber or we can not keep on drifting out ore even with our 'square-set' system of supports." The men of the mines cast longing glances over at the mighty forests of pine and cedar on the slopes of the Sierras. The bull-punchers and the small sawmills around Carson could no longer supply half the demands of the Comstock lode.

"More! More!" the insatiate miners cried, and the time came when eighty million feet of lumber annually went down into the chambers and drifts, and two hundred and fifty thousand cords of wood were burned annually by the Comstock towns and mills. The lumber that was put into the mines was crushed, forced together into solid masses by the weight of moving mountains above. One single mine has often buried lumber at the rate of six million feet a year.

It was plainly possible to continue to cut wagon roads to various points along the eastern slope of the Sierras, even to the top, and then haul logs to the saw-mills in Washoe Valley. This was done for a time, and, if continued, might have developed as extensive a logging business with ox teams as the handling of supplies had already developed in the freighting line. The bull-puncher might then have become as notable and universal a figure as his brothers of the Sierra highways. But the cost of road-making was enormous, owing to the ravages of winter storms, and some better method was needed.

In conveniently steep places, where deep water could be had by a dam, or in a lake, short chutes of tree trunks were made down which large logs could be slid headlong, flaming and smoking from the friction of their rapid descent. There were only a few places where this could be done without injuring the timber. Unless the grade was very steep the logs would not slide. Various other plans were tried. Ordinary square-box flumes were constructed instead of the dry chutes, and were carried for many miles up the winding cañons.

The square-flume plan did not long remain in use, for in 1866 or 1867 experiments were made by a lumberman named Haines, in Kingsbury Cañon, with a simple form of trough that has since been adopted in every mountainous region of the Pacific coast—the famous V-flume. Haines took rough planks two feet wide, an inch and a half thick, and sixteen feet long, and joined them at right angles, lapping successive sections to make any desired length. The flume rested on the hillside, with props against the lower side, and was carried across cañons on trestle work. The next improvement was to join the sections evenly by a V-joint underneath. After a few years flumes of this

pattern were made much larger and were lined with planed boards.

This invention, one of the most interesting of the mining period, came at a time when the Californians had spent large sums trying to handle cheaply and rapidly the immense bodies of timber on the long western slopes of the Sierras where several species of conifers make trees that are often ten or twelve feet in diameter and two hundred and fifty feet high. They adopted the Nevada V-flume system with modifications, placing large mills in the forests and moving the sawed lumber in form for market, millions of feet annually, delivering it in the valley below. On the eastern slopes of the Sierras the descent is much more abrupt and broken, and the trees are smaller than on the western slopes. Here the grade of the flumes was often four feet to a rod; logs and lumber were swept down in torrents of white foam, and sometimes, when jammed, were hurled into the air as if by a powerful explosive. Many mountain slopes which could never have been reached by the bull-punchers were easily cleared by using these short, steep flumes.

One of the largest V-flumes ever built in Nevada was fifteen miles long and contains two million feet of lumber. It carried five hundred cords of wood, or half a million feet of lumber, either sawed or in logs, in a single day. In 1880 ten flumes were reported by the Surveyor General, covering in all eighty miles. The amount of firewood actually flumed that year was 171,000 cords, and of lumber 33,300,000 feet. Ten and fifteen thousand dollars a mile has been spent to construct some of these flumes.

It would seem at first thought that there could be but few other dependent industries besides those already noted in this chapter, but the ramifications of

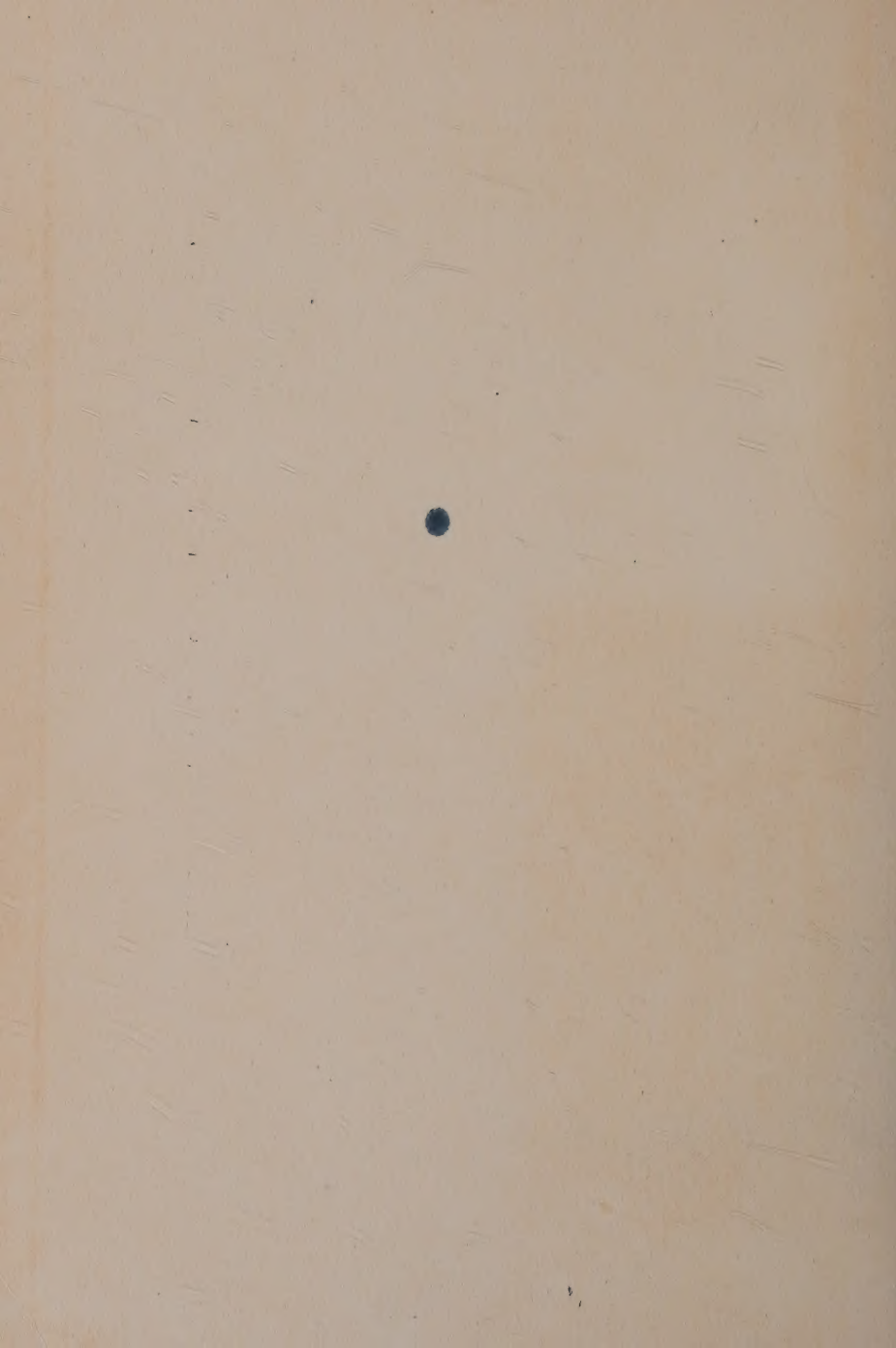
the subject are almost endless. There were the foundries of Virginia City, the first one established in 1863, and soon followed by others, so that all repairs could be made for the mining machinery, and everything except the larger engines could be built. Soda, which was used extensively in the mills, was soon obtained from the desert. Copper ore, mined on Walker River, was used to make sulphate of copper, or bluestone, of which the mills used a great deal. Marshy beds of borax, large deposits of alum, and black oxide of manganese were discovered and to some extent utilized as needed by the Comstock towns.

Salt was freighted across the Sierras until prospectors developed many and extensive deposits. The first efforts to bring salt from beyond the forty-mile desert was remarkable on account of the animals used. The owners of the salt deposit sent to Asia and obtained in good condition nine Bactrian camels in the spring of 1861, and used them for a year or two. Each one carried about five hundred pounds, or twice as much as a pack mule did. They ate nearly every kind of desert vegetation, particularly the harsh "greasewood." On the other hand, they suffered greatly from the alkali, and their drivers despised and neglected them in every conceivable manner, so that the experiment never had a fair trial. In the end some of them died, some were used to carry ore in Arizona, and some escaped and have been reported at intervals by frightened cowboys or astonished tourists in the mountains of northern Arizona and New Mexico.

Thus, as we have seen, the seemingly small and incidental elements in the life of a mining camp really occupy whole regiments of men. These dependent industries were as much the creation of the Comstock as the great hoisting works, the mills, or the

Sutro Tunnel. Destroy public confidence in the value of the mines, and from that moment snows would drift unheeded over the mountain highways and avalanches would sweep them away to remain forever un-restored. Log-cabin stations would be abandoned, flumes would rot on the hillsides, and iron water pipes would rust. Orchards in the mountains would go un-pruned and grapes lie ungathered except by birds and raccoons. When the toiling miner tunnelled into some new deposit of rich ore, valleys and mountains were glad because of his good fortune.





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